TECH[illegible]OGY [illegible]RTM[illegible]T

# AVIATION WEEK

**HIGH OVERHEAD,** through freezing rain or sleet, the modern airliner flies serenely — its propellers completely free of dangerous ice when equipped with automatic, electric de-icing units developed by Hamilton Standard Propellers.

**Dependable de-icing is just one of the results of Hamilton Standard's research and development program. Now being carried on with more intensity than ever before, this program is helping to bring greater safety and efficiency to both commercial and military aviation.**

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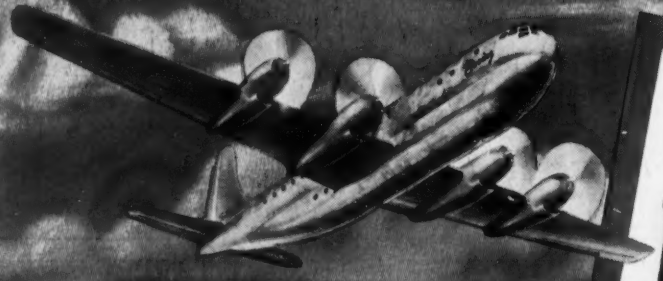


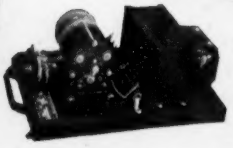
# Window Cleaning Upstairs!

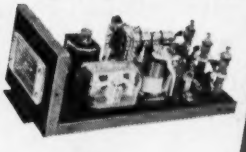
**A new de-icing system powered by Westinghouse keeps cockpit windows free from ice and fog.**

Here are some of the units which make up a window de-icing system like that used on numerous Boeing aircraft including the "Stratocruiser" shown at left.

*Left* — 11-kva, 3-phase, 208/120-volt alternator. (2 units—spare used for galley load) weight — 50 lbs. each.

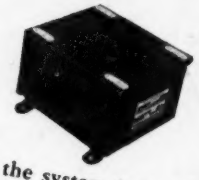
*Below*—Temperature sensing control panel. (Cover removed) weight —3.31 lbs.





*Above* — Voltage regulator. (2 units) weight — 5.10 lbs. each.

*Right* — Differential current protection assembly. (2 units) weight — 2.9 lbs. each.



In addition to the above, the system includes one transformer weighing 12.5 pounds and two double-throw contactors weighing 3.35 pounds each.

Here's an opportunity for you to pack more safety into plane design. A completely automatic de-icing system for cockpit windows . . . another Westinghouse product that performs a vital function in aviation.

First proof of the outstanding performance of this equipment came from an initial installation on the famous Boeing "Stratocruiser" pictured above. Then followed similar applications on other Boeing craft already in the air or in the production or design stage.

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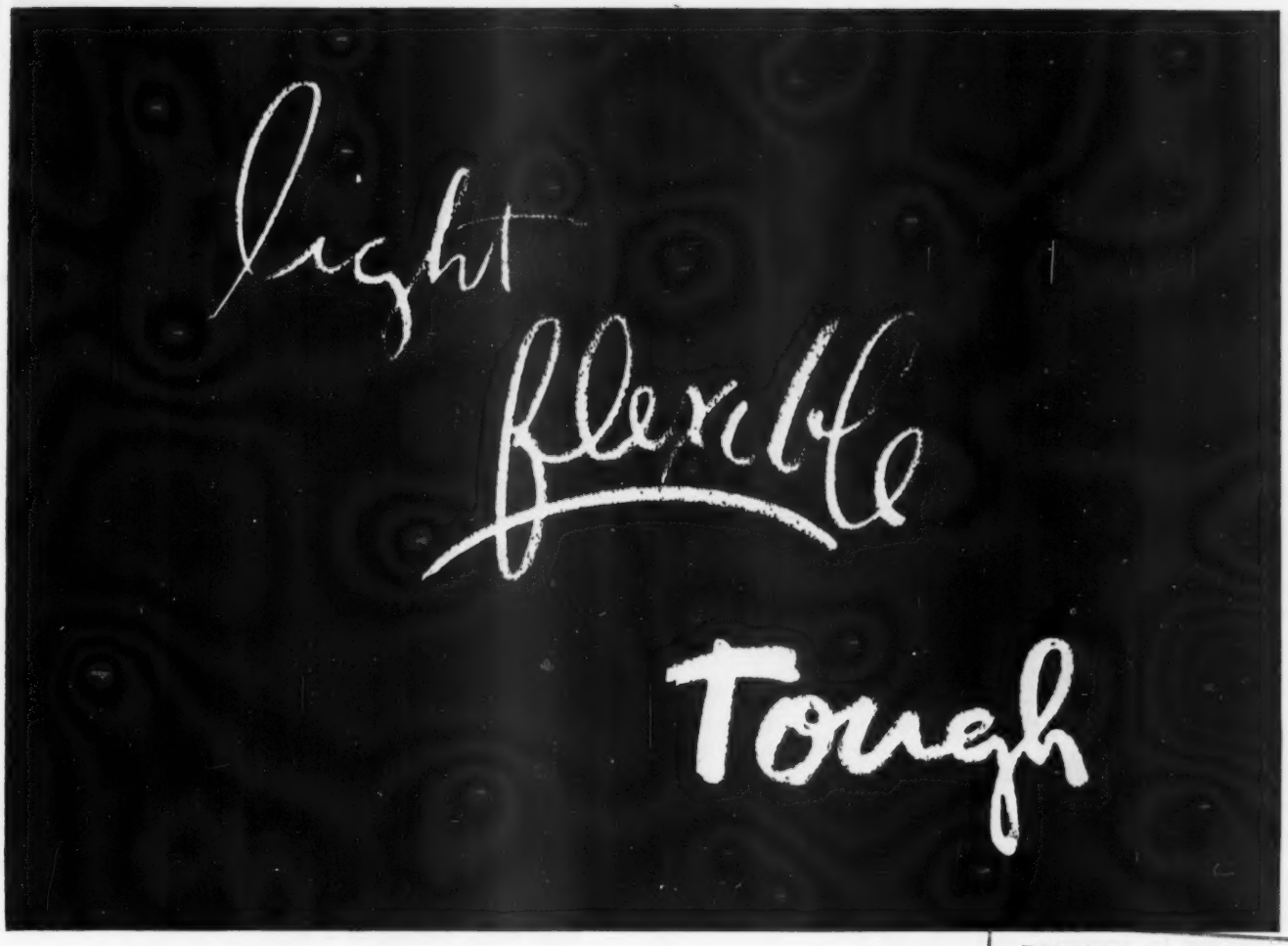


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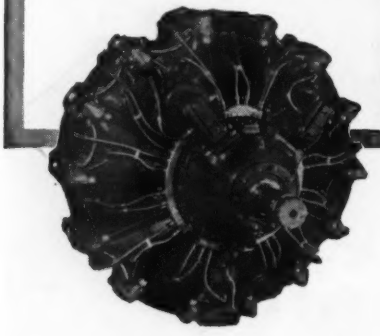

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Vol. 47 No. 19

# AVIATION WEEK

Nov. 10, 1947

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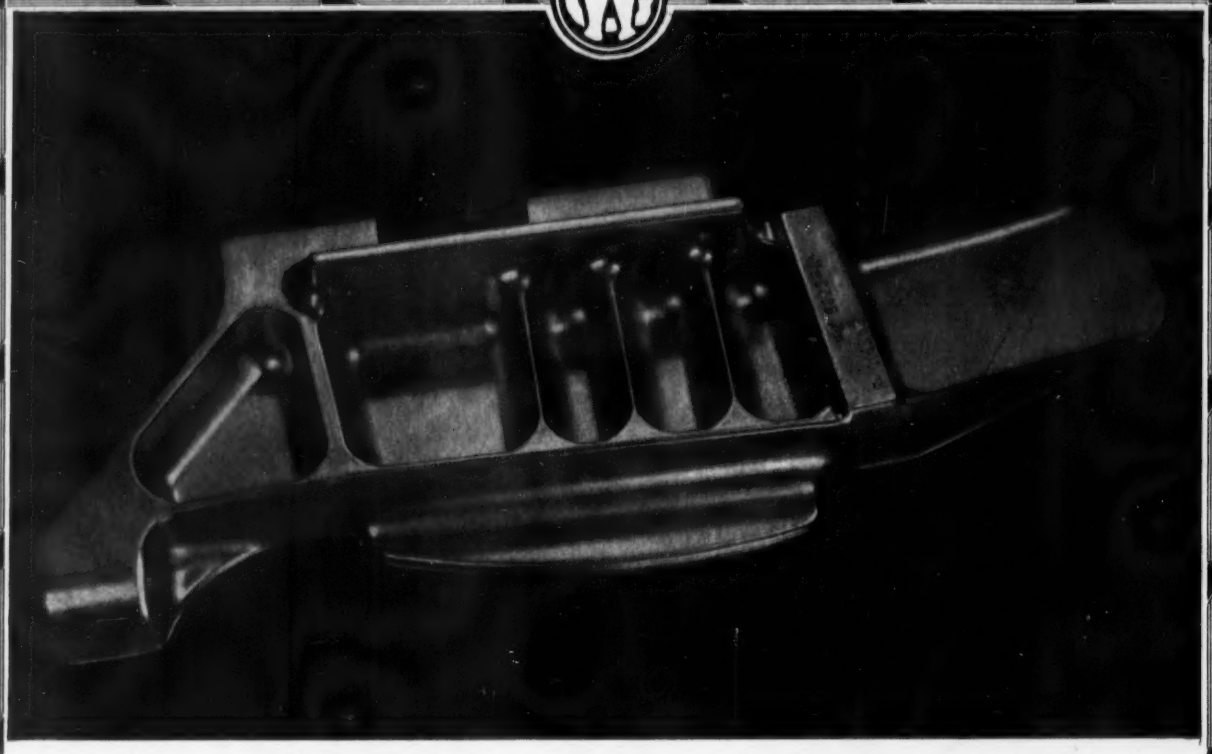

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# THE AVIATION WEEK

**NEW DAY A-COMING**—Last year the airlines, in manner of speaking, just had to stand and take it. This year, the situation is somewhat better, on the surface at least. CAA has authorized use of its instrument landing system at about half a hundred airports and although the dispute over the system's effectiveness (which was the big issue last year) still goes on, ILS should be of some help.

The radar ground controlled approach system is in and working (but still only as a supplemental aid) at Chicago, New York and Washington. There has been some progress on approach lighting.

With those exceptions, the situation is much like it was a year ago. The big developments that are promised to assure reliable, all-weather flying are still coming. In their absence, the airlines and others concerned are doing the best within their means. The re-division of traffic between LaGuardia and Newark is a start—if the reduction of 122 flights daily in or out of LaGuardia is adhered to. Once before an airline tried transferring some of its flights to Newark, and other lines scheduled more flights for LaGuardia, making the last state of that field worse than the first.

**ON THE SIDELINES**—In some respects the airlines are as much on the sidelines in the reliability tangle as are the passengers. Apart from the financial impossibility of the airlines' installing or operating ground landing aids, there is also the regulatory impossibility.

CAA determines whether or not a landing aid can be used, regardless of who installs it. Private installation of GCA at several points has not resulted in either CAA enthusiasm or relaxation of restrictions as to its use.

CAA's authority over landing aids carries with it the responsibility for underwriting their installation. Yet, contrary-wise, in the view of some observers, CAA's chances of obtaining increased funds for landing aids diminishes in ratio to the airlines' increases in deficits.

For this, rightly or wrongly, gives ammunition to those who clamor that the federal government is financing mismanagement in air transportation. Before the President's Air Policy Commission, the Association of American Railroads renewed its old argument that, by developing and installing air navigation aids, the government is underwriting one mode of transportation at the expense of another.

That is an argument for which those in aviation have many answers. But it is an argument which those in aviation concede has persuasiveness with a tax-ridden public that is not being served on schedule by the airline recipients of what the railroads term subsidies.

**RELIABILITY ON TRIAL**—The airlines' annual trial by weather has begun. While the stone-skipping act of Howard Hughes' giant flying boat and the subsequent reopening of the Senate's Hughes investigation captures the headlines, the airlines' difficulties with reliability again become the significant, if less dramatic happening in aviation.

The deceptively mild fall weather on the East Coast—the greatest traffic-generating area in the country—changed suddenly. LaGuardia field, hub of much of the traffic, was virtually closed for three days, re-opened, was closed again as a northeaster poured water over the runways and finally opened for limited use that backed up traffic miles away.

Airlines are switching to "winter schedules"—actually, fewer flights which, it is hoped, will mean higher load factors on those trips that do go.

Between New York and Washington, most heavily-traveled route in the country, trains are jammed. In parlor and lounge cars, passengers swap stories of the flights that were cancelled, or the departure delays they suffered the last time they tried to fly.

Winter troubles of airlines are an annual occurrence that was more serious last year than the year before and, unless alleviated, will be even more serious this year.

**IMPACT ON PROFITS**—The grumbling of the passenger who planned to fly and couldn't is not the most critical factor in the reliability situation. The passenger will eventually return to the airlines. But his fare is gone now, when it is so badly needed.

Last winter, according to one estimate, the scheduled airlines lost about $25,000,000 in revenue due to cancellations. They entered last winter with an overall profit. On Sept. 30 this year, the airlines had an overall loss of around $10,000,000.

In a recent report to CAB, one airline suggested that travelers it lost last winter due to unreliability did not begin using the airlines again until midsummer. More and more, confirmed air travelers are turning away from airlines for short trips—particularly in the New York area.

An hour's delay at departure and an hour in a stack at the other end is not unusual anymore. A two-hour-fifteen minute trip on a DC-6 from Washington to New York (Flight time: 45 minutes) is an example.

Unreliability puts a drain on airline finances that has an effect on the manufacturing industry. This was implicit in the comment of Donald Douglas when he appeared before the President's Air Policy Commission that more than a subsidy for the manufacturing industry, aviation needed landing aids.

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# NEWS DIGEST

## DOMESTIC

**Accelerated service** tests of the Convair Liner were expected to begin last week. Testing of the transport's cabin pressurization system were completed early this month, ending the review of components by Civil Aeronautics Administration engineers.

**Richard H. Depew, Jr.,** old-time pilot, has joined the Frank Ambrose Aviation Co. as director of domestic sales. He was formerly associated with the Ludington-Griswold Corp., toy airplane manufacturers.

**Charles D. Frazer,** former secretary of the Air Power League, has been appointed executive secretary and assistant treasurer of the National Air Council.

**Civil Aeronautics Board** examiner has recommended that Southwest Airways' AM 76 feeder certificate be modified to permit scheduling trips short of terminal points. Southwest contends that traffic potential over all parts of its route segments is not equal so that it is compelled to fly considerable unnecessary and wasteful mileage when required to maintain all schedules from end to end.

## FINANCIAL

**McDonnell Aircraft Corp.** reports a net income of $540,869 equal to $2.24 per common share for the year ended June 30. This compares with a loss of $226,134 for the previous year.

**National Airlines** reports a loss of $629,424 for the three months ended Sept. 30 compared with a profit of $249,360 for the same period last year.

**Wisconsin Central Airlines'** board of directors has approved a $700,000 stock issue and authorized a change in the capital structure from 30,000 shares of $1 par value common to 300,000 shares of $1 par. Wisconsin Central will register 175,000 shares with the SEC at $4 per share.

## FOREIGN

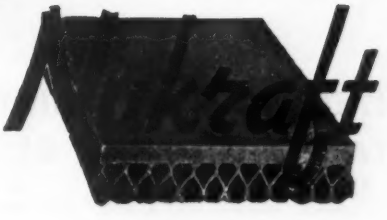
**British Overseas Airways Corporation** inaugurated the first British civil air route between Ceylon and Singapore. The once-weekly service will use Avro York transports, which will cover the 1,700 mile route in nine and one-half hours. One way fare is $193, and round trip is $346. BOAC also announced a new weekly service between London and Malta using Douglas Dakota transports.

**Compania Mexicana De Aviacion** has placed Douglas DC-4 transports in operation on its daily round-trip service between Mexico City-Tampico-Monterrey.

# PLANE Comfort

measured in ounces
. . not pounds

with FEATHER-LIGHT

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Vol. 47 No. 19

AVIATION WEEK

Nov. 10, 1947

INCORPORATING AVIATION AND AVIATION NEWS

IN THE AIR: Howard Hughes' Flying Boat as it first became airborne over Los Angeles harbor. (A. U. Schmidt photo)

# Hughes Answers Senate Probe With First Flying Boat Flight

## 200 ton, eight engine aircraft answers many questions in initial test hop over Los Angeles harbor.

By SCHOLER BANGS

Howard Hughes at 1:40 P.M. on the blustery Sunday afternoon of Nov. 2 lifted his big eight-engine flying boat off the water of Los Angeles harbor after two brief taxi runs and let it fly for a mile before setting down directly abeam newsreel and newspaper cameramen crowding the deck of showman Earl Carroll's yacht "Vanities".

The flying boat was airborne at an indicated speed of 80 mph. and at a weight of 276,000 of a designed gross of "in excess of 400,000 lb. It carried 2,000 gallons of fuel in its 14,000 gal. tanks. During its brief off-and-on hop air speed rose to 94 mph. Within the space of three hours Hughes gave the aircraft industry it first practical "fix" for evaluating, in cost and performance, all paper projections of massive aircraft. He crossed out in quick succession critical questions raised against the world's biggest plane:

• **Surface Handling**—More than an hour was spent in gingerly towing the flying boat, tethered fore and aft to "sea mules," through a breakwater entrance of the inner harbor to the takeoff stretches of the outer harbor. But after the two taxi runs and flight Hughes powered the boat unaided through the Sunday water traffic and brought it to anchorage as accurately as if it had been a yacht.

• **Taxiing**—The flying boat responded quickly, to rudder and engines at both low and high speeds. No yawing tendency was noticed, even when the left wingtip pontoon was allowed to drag the water during one high speed run. There was no evident lessening of control when Hughes at one time had to veer sharply to avoid a sight-seeing water taxi.

• **Takeoff**—The boat climbed quickly out of the water and onto its step, without wallowing or hunting. Despite choppiness of the water, hull spray fell away well below the propeller line, and as speed developed the spray took on appearance of an airfoil curve that fell sharply toward the stern and into a flat, smooth wake left by the hull. There was no porpoising. The boat broke cleanly clear of the water without any apparent altering of trim.

• **Landing**—Stability of the flying boat upon contact was such that crew members were not aware, immediately, that they had landed.

• **Control**—Response of the plane to the forces of all control surfaces, and quick response to initiating controls in the cabin, were attested by Hughes' willingness to take it into the air after the briefest of preliminary taxi runs.

The plane was tested with hydraulic control boost cylinders, originally grouped close to cabin controls, hydraulic valves actuated by cables from cabin controls. It was this reworking of the control hydraulic system, to eliminate delayed action and surging, that prevented the testing of the Hughes boat months earlier.

### Boat Specs

Here are exact dimensional specifications of the Hughes Flying Boat:

| | |
|---|---|
| Hull length | 218 ft. 6¼ in. |
| Bottom of hull to top of vertical stabilizer | 79 ft. 3⅜ in. |
| Wing span | 320 ft. 6 in. |
| Horizontal stabilizer span | 113 ft. 6 in. |
| Root chord | 51 ft. 9¾ in. |
| Tip chord | 19 ft. 7¾ in. |
| Wing root thickness | 11 ft. 6 in. |

► **Hull Integrity**—Prior to launching, the flying boat was water tested in its graving dock. During Nov. 2 pre-flight taxiing the hull was subjected to choppy water just short of developing whitecaps, and on two occasions the heavy wake waves of boats entering the harbor. After mooring, crew members estimated that only "a few pints" of water had entered the hull. They believed that responsible minor leaks would seal by swelling. Hughes structure engineers said that the duramold hull is able to accept the stresses of rough water better than a metal structure.

Such were the immediate anxieties of all who watched the tests, including Army and Navy expert E. P. Hartman, engineering liaison representative of NACA at Los Angeles; and engineers of almost every airframe manufacturer in Southern California, who viewed the event from a regatta of yachts bordering the test course.

Riding in the flying boat was George Haldeman, chief of the aircraft and components section of CAA Region Six, recently appointed by a committee of Army, Navy, NACA, CAA and Reconstruction Finance Corp. to serve as a technical observer of all tests of the Hughes craft.

► **Tests Next Year**—Full flight tests possibly will not be made until early next year. Before his unexpected hop, Hughes had said that he did not intend to begin flights before next March or April. There is no apparent question in the minds of either Hughes or his engineering staff that the boat will perform adequately in flight maneuvers.

Chief concern during the coming months will be its behavior in high speed taxiing as loads are increased, and as the plane is tested under varying centers of gravity; ranging from 18 to 34 percent of the chord. During the Nov. 2 runs the C.G. was located well to the rear, at about 28 percent, to create a condition that would minimize any porpoising tendency. During surface tests balance will be shifted in small increments until the full range of C.G. travel has been proved out.

► **Hughes' Practice**—In this critical stage of tests probably no flying boat pilot could be expected to exceed the ability of Hughes, who has run thousands of landing tests with his Sikorsky S-43 in studies of load balance characteristics. A week prior to the Nov. 2 runs, Hughes shot 126 landings in one afternoon with his Sikorsky on the Colorado River behind Parker Dam in furtherance of these studies.

As tests progress, keen attention will be paid to the drag characteristics of the big boat. Hughes engineers decline to reveal the overall drag coefficient other than to say that it is remarkably low, and that the hull has the lowest drag ever designed into a flying boat. One engineer told AVIATION WEEK that the hull has considerably less drag, relatively, than that of a DC-3.

Direct indication of the flying boat's low drag is that model tests indicate that in riding at anchor it will exert a pull of not much more than 2,000 lbs. in a 70 mph. wind. However, as a safeguard against shock loads in heavy waves, the main mooring stub in the hull nose has been designed to accept a 50,000 lb. pull.

► **Low Drag Characteristics**—As in the hull design, the wing has been developed with emphasis upon low drag characteristics, and efficiencies displayed under varying conditions of load in flight will influence strongly the planing of comparable or bigger flying boats. The Hughes boat wing has an aspect ratio of 9, and root and tip chords of 50 and 20 ft. produce a mean aerodynamic chord of 40 ft.

Particular interest was shown in the builder's ability to come out with apparently perfect balance, and at anchor the boat rode with pontoons uniformly above water. Interest also centered upon the beam effect of the hull, and the fact that even under strong wind gusts a strong boat stability was evident.

To few familiar with Hughes was his takeoff more than a mild surprise.

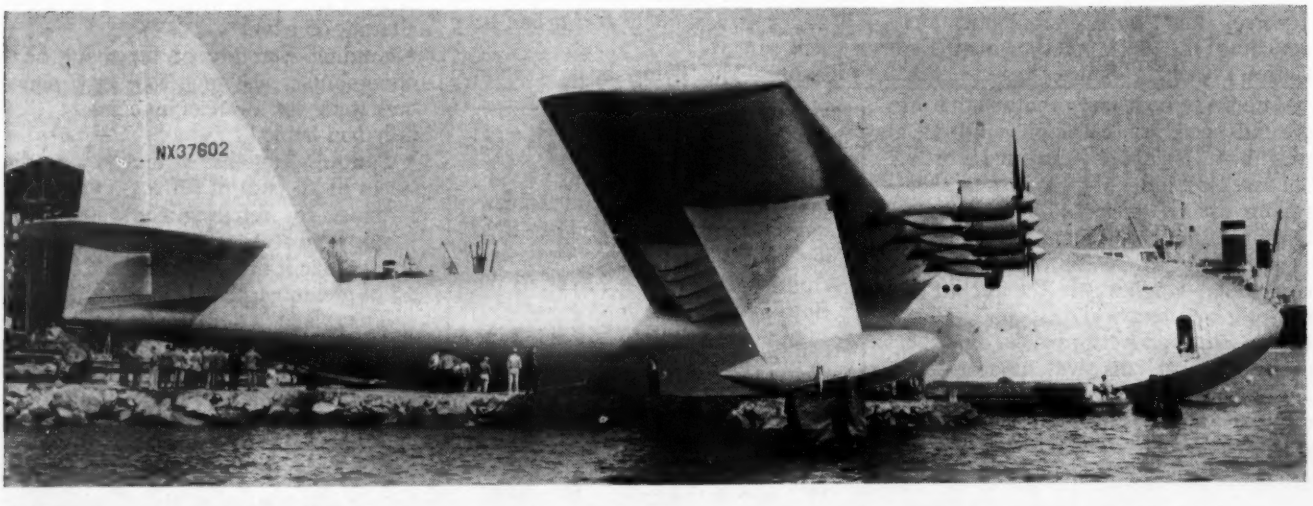
There was a feeling of certainty that if the boat "felt right" he would lift it off, if for no other reason than to be able to go before Senator Brewster with a pat reply to all who might have planned further attack on the spending of millions on a "contraption that hasn't even flown."

## Remove Flares

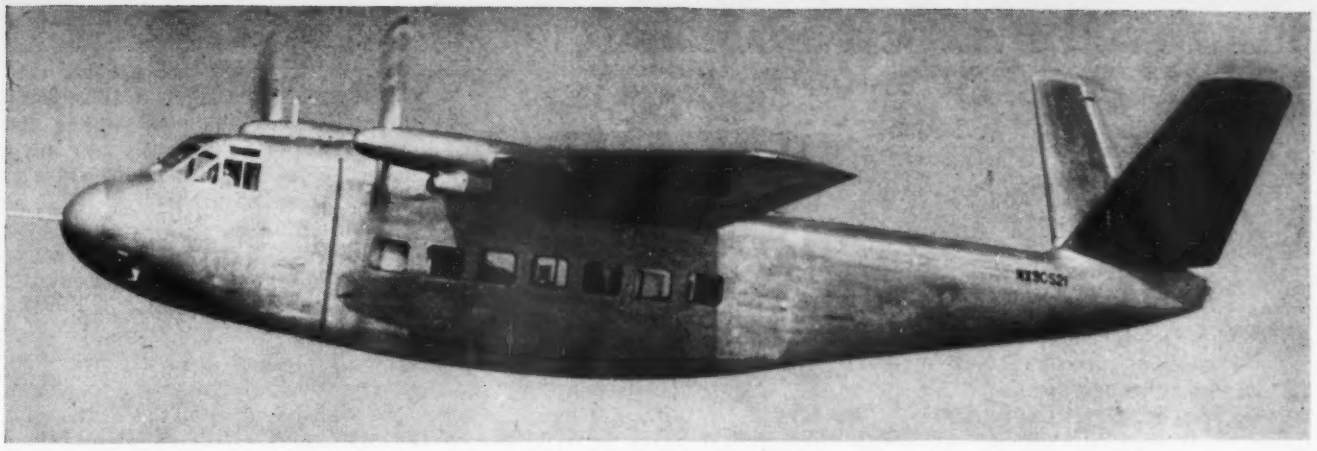
Public hearings on the crash of a United Airlines DC-6 near Bryce Canyon Airport fatal to all 52 persons aboard, opened last week at Panguitch, Utah, as the Civil Aeronautics Board ordered airlines to remove parachute flares from their DC-6's. The flares are carried to illuminate emergency night landings.

On the scene crash investigation indicated that the fire in the United DC-6 was confined to the right side of the plane in an area including the aft baggage compartment and the wing root trailing edge. Investigators reported that the wing was burned well out on the flap.

Parachute flares are carried in the wing root section. The CAB removal order noted that the flares "may have contributed substantially to the intensity of the fire" on the United DC-6. It has not yet been determined whether the flares were the primary cause of the fire or were set off as a result of combustion elsewhere.




**OFFICIAL LAUNCHING: Observers were dwarfed when the Hughes Flying Boat was launched for its first tests. (I N Photo)**



# Flying The Novel Beech Twin-Quad

Radical features of Beech Aircraft Corp.'s 20-passenger feederliner, now undergoing flight tests at Wichita, are plainly apparent in the latest photographs of the four-engine, two-propeller transport.

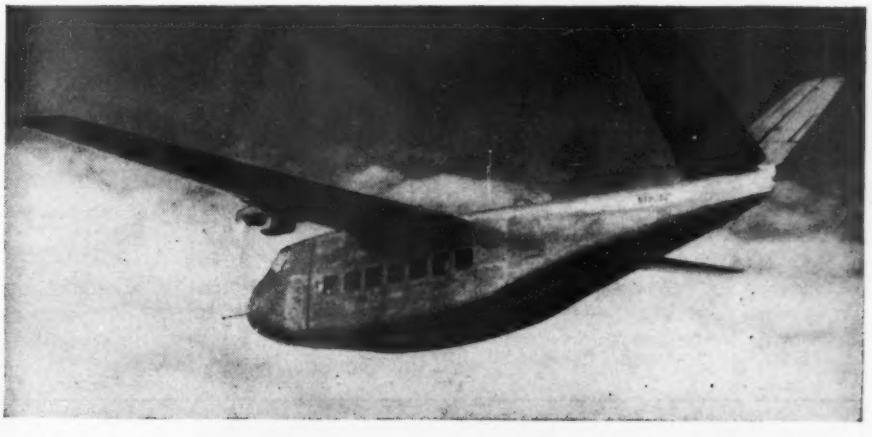
The company claims four "firsts" for the plane: first airplane to be equipped with engines completely submerged in the wings; first to combine four engines with two propellers; first to have integral emergency landing keels on the bottom; and first large airplane to have a V tail.

As a result of these features, original or not, the Twin-Quad appears to give excellent passenger visibility (inherent in a high-wing design) and has aerodynamic cleanliness largely due to the buried powerplant installation. The landing skids on each side of the fuselage give the underside a rounded appearance, although in reality the floor of the cabin is flat.

Beech is still not elaborating on specifications or performance of the plane. Original plans, however, called for using four Lycoming engines normally rated at 320 hp. and developing 375 hp. for take-off. These are flat, eight-cylinder engines arranged in pairs spanwise in the wings and drive the propellers through special gears. Large, slow-turning propellers reduce the noise of the plane and also contribute to propeller efficiency.

Beech is stressing the utility of the Twin-Quad for operations from small fields and at one time calculated that take-off distance at sea level over a 50 ft. obstacle with one engine out would be 2,600 ft.

The V tail of the Twin-Quad has a more acute angle than that between the two surfaces of the Bonanza, Beech's four-place personal plane, the first production airplane with the butterfly empennage. During the war Beech experimented with this configuration on a military version of its twin-engine D-18 type.



# Improved Protective Design Offers Lightplane Safety Hope

## Crash injury research cites benefits from devices already available; plugs for more.

An important future reduction in air accident crashes and fatalities appears likely if the recent aircraft engineering trend toward improved structural protective design for occupants in plane crashes noted in several companies continues.

Behind the engineering trend is a small but growing system of detailed accident injury reporting and analysis which centers at Crash Injury Research, 1300 York Avenue, New York.

▶ **Report Center**—Hugh Dehaven, director of the research organization, which is sponsored by National Research Council, and financed modestly by several government, industry and consumer backers, is already getting a few reports which reflect that safety design recommendations are "paying off" and point the way to additional design changes beyond those initially recommended.

Organization of his reporting system is a slow process, Dehaven points out, since it involves visits to the agencies who will make the reports (in most cases, state aviation agencies) and explaining to them in considerable detail what is needed. But after a few reports have been received, and criticized for omission of important details, subsequent reports begin to assume a uniformity which is valuable for statistical analysis.

▶ **Uniformity of Reports**—At the recent convention of the National Association of State Aviation Officials, at Ft. Worth, Dehaven told the aviation officials of 35 states represented there of the need for uniformity of accident reports and appealed for their cooperation in submitting crash reports, showing not only the nature of injuries and their cause, but also cases in which plane occupants escaped from serious crashes with only minor injuries, due to protection provided by the airplane structure.

Indications of a growing trend toward state airplane accident investigations and analysis, at the NASAO meeting, and its encouragement by federal aviation agencies, makes it likely that in the near future for more complete coverage of these accidents will be available from official state sources than now exists.

Future safety design trends, Dehaven believes, should include such items as:

• **Main structural units** such as wings and nose, stressed to "fail progressively" so as to absorb crash impact, gradually.

• **Designing main structural** members surrounding the cabin, so that any powerful bending force will cause them to buckle outward, away from the occupants.

• **Increasing distance** between plane occupants and the nose of the plane, so that the impact of a crash will be absorbed by collapse of the forward structure.

• **Design of instrument panels** as metallic cushions, of thin curved sheet-metal which can be dented deeply by the heads of the front seat occupants, without serious injuries. Dehaven can show a small piece of sheet metal which he dented with his own head as a proof of his theory.

Dehaven is discouraged about the apparent pilot antipathy to shoulder harness. Although service pilots records have proved its efficiency in preventing head injuries in serious crashes, and although many thousands of aviation people saw it demonstrated graphically at the National Air Races last September, when Jack Hardwicke, of Arcadia, Calif. unfastened his shoulder harness and climbed out of a P-51 crash with only a bruised elbow, civilian pilots refuse to wear it for ordinary flying. It should be worn, continually, since there is little time in a crash emergency, to stop to put it on. Pilots generally complain about the restrictive nature of the harness.

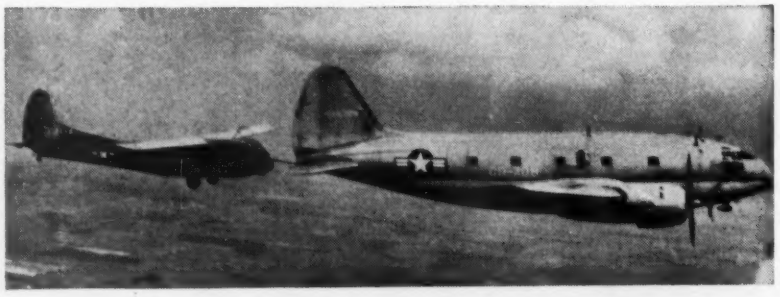
▶ **Need Cushion Panel**—If the pilot won't use shoulder harness to protect his head, Dehaven thinks the designer should do it with a metallic cushion panel, plus a safety design wheel, and a double-strength safety belt, anchored to the primary structure of the airplane so it won't give way under ordinary crash impact.

The "dish-shaped" curved safety wheel introduced more than a year ago, is becoming the general rule on personal planes using wheel controls, although a few manufacturers have not yet caught up with the procession. Theory is that the wheel fits the shape of the chest of the pilot, or front seat passenger. It is made of ductile metal which bends under stress without shattering and makes an excellent chest protector. This is more than a theory. Recent accident reports have shown the protective value of the wheels in cases vvery much like those anticipated in its design.

Dehaven thinks that the safety wheel design could go still farther to exert some sort of a braking force or brace the pilot to prevent his being thrown forward. This might take the form of a braking device which could lock the wheel in full-back position in event of a crash. The column could be designed so that it would bend into a locking position, in the event of a crash. There is reportedly some CAA technical engineering objections to the locking device.

▶ **Personal Check**—The research director, a World War I military pilot, has returned to flying as a private pilot, after years on the ground, in order to make some personal checks of his theories. He began his crash studies for the Army and Navy under Research Council auspices during World War II. He believes that coupled with all the anti-crash protection that can be designed into the personal plane should come slower landing speeds, which will make any crash impact less severe.

He sums up his philosophy: "We will never be able to design an airplane which is incapable of crashing, nor have the automobile designers, or the builders of any other vehicles been able to do such a design job. What we must work for is to design airplanes for survival crashes."



**NEW METHOD OF TOWING**

**Use of a four foot metal bar as a replacement for a tow-rope is demonstrated by this CG-15A glider shown rigidly attached to its C-46 tow plane, allowing the two crafts to operate as one unit. Recently perfected, the system is now undergoing tests at Wright Field. (Press Assn. Photo)**

# Republic Gets New Order For 130 P-84s

Republic Aviation Corp.'s new $15,500,000 order for 130 model P-84 Thunderjet fighters brings to a total of seven the number of fighter groups slated for formation using the sleek jet craft. Formation of the 14th fighter group, first Thunderjet operational unit, has been completed and 81 of the fast fighters are now located at Dow Field, Bangor, Maine.

Republic is now well under way on the construction of the first Thunderjet order for 500 at a cost of about $25,000,000. The new additional order brings the total P-84's on order to more than 550, which are not scheduled for completion until June 30, 1949, and brings the Republic backlog to $78,000,000.

The new order assures the P-84 of first-rank importance in the new all-jet Air Force by replacing the Lockheed P-80, production on which is slated to taper off next spring. Although the P-84 is considerably heavier than the P-80, it is about 10 percent faster. This additional speed is gained on the same 4,000 lb. static thrust through the use of a late-model laminar flow wing and careful attention to fuselage lines.

Simultaneously with the announcement of the new contract, the Air Force revealed that the P-84 is now fully operational, having completed the last of its armament trials. During these trials, conducted by 1st. Lieut. William A. Kruge, Air Materiel command test pilot, about 70,000 rounds of .50 caliber ammunition were fired—a minimum of 10,000 rounds per gun. The Thunderjet guns are a new type with a rate-of-fire of 1,200 rounds per minute, 50 per cent faster than the standard World War II aircraft machine gun.

**NASAO ELECTS CORNISH**

**Clarence F. Cornish, center, aeronautics director of Indiana, was elected president of the National Association of State Aviation Officials, at the Ft. Worth convention, succeeding Leslie L. Schroeder, Minnesota aeronautics director. Other new officers pictured from left: H. R. Wiley, Montana, vice president; E. F. Knapp, Vermont, secretary-treasurer; C. E. A. Brown, Ohio, vice president, and William C. Lazarus, Florida, vice president.**

## Brewster Skeptical on Cost Plus Air Mail Payments

Maine's Sen. Owen Brewster (R.), chairman of the transportation subcommittee of the joint Congressional Air Policy Committee, looks skeptically on House Post Office committee Chairman Edward Rees' (R., Kans.) suggestion that cost-plus-reasonable-profit payments to carriers for mail carrying be separated from subsidy payments. Brewster doubts the feasibility of setting a cost-plus-reasonable profit rate, since "this depends on what should be included in 'cost'—a matter on which there is great difference of opinion."

Rees has proposed a 25 cents per ton mile rate—subject to change by information unearthed during hearings of the subcommittee he has named to investigate airmail operations of the Post Office Department. Hearings have not yet been scheduled, probably will get underway shortly after the special session convened in mid-November. Rees feels that a rate approximating 25 cents would be in line with carriers' charge for commercial freight shipments, averaging 14 cents per ton mile. It would place all air carriers in the subsidy class —the lowest average rate now paid to an air carrier is Eastern's average of 44.56 cents per ton mile. Payments to the 16 domestic trunk lines now average 68 cents, and to the feeder lines, $23.49.

## More Pilots

United States Air Force has upped its pilot training plans from the present 1,000-per-year rate to at least 3,000-per-year during 1948 with the first 20,000 graduates scheduled for commissioning in 1949. The expansion program is required to meet the USAF's 70-group program. By mid-1948 a total of 337,000 enlisted men and 64,000 officers, enough to man 55 air groups, will be in service.

To meet the new quotas, pilot procurement procedures are being streamlined and aviation cadet tests can now be taken at 55 major USAF bases throughout the country. Basic requirement is that the applicant be an unmarried male between 20 and 26½ years of age, have completed two years of college or pass an equivalent examination.

# IAM-UAW Vie For Aircraft Workers

Intensive competition for union members among airframe employees in the face of reduced postwar employment continues between the International Association of Machinists, a former AFL affiliate, and the United Automobile, Aircraft and Agricultural Implement Workers (UAW-CIO).

As a result, the UAW-CIO executive board has voted to reverse its decision of last July to boycott NLRB, but refusal of Vice President R. J. Thomas to sign a non-Communist affidavit has thrown the issue into this week's convention in Atlantic City.

► **IAM Advantage**—The IAM already has qualified for NLRB service under the Taft-Hartley law by filing organizational and financial reports with the Secretary of Labor and non-Communist affidavits by its officials with NLRB. Consequently, it stands a good chance of replacing the UAW-CIO as bargaining agent for more than 6,000 production employees at Glenn L. Martin near Baltimore.

The CIO union finished ahead of IAM, 2,729 votes to 1,916, in an NLRB election Aug. 21, but needs 385 of the 617 challenged ballots to obtain a majority. There were 965 who voted for no union. NLRB has refused to examine the disputed ballots pending a decision by UAW-CIO as to whether it will comply with the new labor law.

► **NLRB Boycott**—UAW-CIO risks loss of members and bargaining rights at this and other airframe plants unless it ends

**PIONEER IN FLIGHT**

**New flight photo of the Northrop Pioneer prototype which is undergoing extensive re-design for production in three different versions: for Arctic rescue work; for assault transport operations and standard cargo carrying functions.**

its boycott of NLRB. Its ability to compete with the IAM will suffer drastically, as at Consolidated Vultee in San Diego, where the UAW-CIO's petition to oust the IAM lies dormant.

Cy Halloran, UAW-CIO West Coast regional director, has warned the executive board that the union risks loss of all members in the aircraft industry. Emil Mazey, regional director in Detroit, goes further. He says the entire union risks self-destruction.

▶ **Individual Suits**—At B and H Aircraft Co. of Long Island City, for example, 63 discharged strikers had to file individual suits for reinstatement after NLRB could not act on a complaint filed by their union, UAW-CIO.

President Walter P. Reuther has promised to build up the union's aircraft department to a major status. The union sunk more than $233,800 in aircraft activities during the first year after the war.

Unless it qualifies under the law, however, the UAW-CIO can hardly "build up" its aircraft membership. Employment of production and related workers in airframe manufacturing is down to 102,000, according to Aircraft Industries Association. This is only a small fraction of the 1944 wartime peak.

Presently, UAW-CIO is also prevented from negotiating union shop contracts and stands exposed to aggressive tactics, as at Glenn L. Martin, of the IAM, already dominant in the industry.

IAM claims contracts with Beech, Boeing, Cessna, Consolidated Vultee, Culver, Douglas, Globe, Lockheed and McDonnell. UAW-CIO's major agreements are with North American, Curtiss-Wright, Glenn L. Martin and Bell.

# Program Is Set For Aviation Clinic

Approximately 500 advance reservations were reported last week as preparations for the Fifth National Aviation Clinic to be held at the Illinois State Capitol, Springfield, Ill., Nov. 19 to 22 were nearing completion.

As in past years when it met in Oklahoma City, the 1947 Clinic is planned as a sounding board for all aviation interests, and will include 98 official representatives from a widely divergent group of aviation and public-interest organizations. However, this year the Clinic sessions will be conducted as a one-house legislative assembly, with 18 bills of aviation policy, already scheduled for introduction, debate, committee action and passage or rejection. Other bills will be presented to the rules committee for possible introduction.

▶ **Boreman to Preside**—Arthur I. Boreman, Des Moines, president of National Aeronautic Association and Gov. Dwight H. Green of Illinois, are co-general chairmen of the Clinic. Other Clinic officers are: Lowell H. Swenson, NAA executive vice president, and vice chairman of the Clinic; Robert Dewey, Illinois state aeronautics director, Clinic secretary; R. M. Phelps, Clinic director; and Robert B. Ramspeck, Air Transport Association executive vice president, legislative consultant.

Invitations to approximately 4,500 leaders of the aviation industry have been sent out with emphasis by Gov. Green and Boreman on the "serious tenor" of the 1947 meeting and the "urgent need for promotion of national security through air power and the integration of a comprehensive national air policy."

▶ **Pogue Speaker**—Set speeches to be made at the Clinic will be held to a minimum, with an overall objective of giving each official delegate maximum time to express his views, and state supporting facts.

L. Welch Pogue, immediate past president of NAA, and former CAB chairman, will be speaker of the Clinic, and Gov. Green will convene the Clinic. Wesley E. Keller, of Minot, N. D., is chairman of the Clinic rules committee, which will pass on much of the procedure.

Ten general subjects will be considered in forming of a basic set of policies at the Clinic, including: air transportation by common carrier or scheduled airlines; civilian flying (including everything except flying services for hire); aviation education and safety, air defense and national security; aviation regulation and legislation; aviation economics, aviation manufacturing, aviation ground and airway facilities, international aviation relations, general public acceptance and goodwill, and research and development.

## XC-99 Test

Convair's XC-99, world's largest land-based transport, was to begin formal taxi tests last Thursday, and test flight was set for Sunday, Nov. 23. The big plane was taxied under the power of four of its six engines to Lindbergh Field's engine warmup apron Nov. 1.

**RAIN FROM DRY ICE**

**Inspecting the cutting head of a dry-ice shaving and distribution unit used in cloud precipitation are C. S. Barnes, designer of the equipment, and Frank Harmonson, both of the Range Developing Co., Phoenix, Ariz. Dry ice blocks carried in the square compartment are fed into the front of the machine where they are sliced into predetermined sizes by a rotary knife.**

# LETTERS

## NOTAMS Complaint

*To the Editor:*

Mr. W. S. Law's letter in AVIATION WEEK Sept. 15, concerning Weekly Notice to Airmen hit the nail on the head.

The charts published in the former NOTAMS were invaluable to cross-country flying as up-to-date facility listings available in no other way. Pilots flying alone cannot have a reference library consisting of latest maps, back issues of NOTAMS, etc., at their fingertips in a two or four passenger airplane.

NOTAMS were one of the few *helpful* rather than restrictive CAA functions. With its discontinuance CAA's trend to limit flying aids is further increased along with reduction in emergency fields, weather stations, and civil airway lighting.

With Mr. Law, we hope the voice of those interested in business and private flying will be strong enough to move our government to provide the services for which we pay.

J. C. SCHWARZENBACH, President
U. S. Propellers, Inc.
Pasadena, Cal.

## Cross Country Training

*To the Editor:*

Having only recently severed my connection as assistant to Ohio's Director of Aviation, I read with interest your article September 29 on flight training.

While I hasten to give full credit to Charlie Cox of the CAA for the many splendid improvements he has made in the training and lot of the personal pilot, I am loath to give Mr. Cox or anyone else credit for the "experimental flight training program" now being conducted at Ohio University, Athens.

I remember so well the long struggle of C. E. A. Brown, Ohio's Director of Aviation, in "selling the powers that be" on his brain child . . . a course of flight training involving greater emphasis on cross-country flying and less on the acrobatics in order to produce a safer, saner, more competent personal pilot. After many months of trying to interest universities in Ohio, Mr. Brown finally sold Ohio University's flight school on undertaking this training. He also sold the general inspection section and regional personnel of CAA on approving it. Last, but probably most important, he has interested George W. Burgess, deputy administrator of CAA, to the extent that Mr. Burgess is watching the program at Ohio University very closely. I understand that Mr. Burgess has written Mr. Brown for additional material in order that he might discuss the program with the nonscheduled flying advisory committee at its meeting this month, and at the meeting of regional CAA administrators in November, to say nothing of the NASAO meeting at Fort Worth.

As Director of Aviation for Ohio, Mr. Brown gives to the industry the benefit of his many years in private and commercial aviation and a wealth of knowledge gleaned from his years as "probably the best instructor in navigation and ground school subjects in these parts."

JOHN H. MACLEOD, JR.
Columbus, Ohio

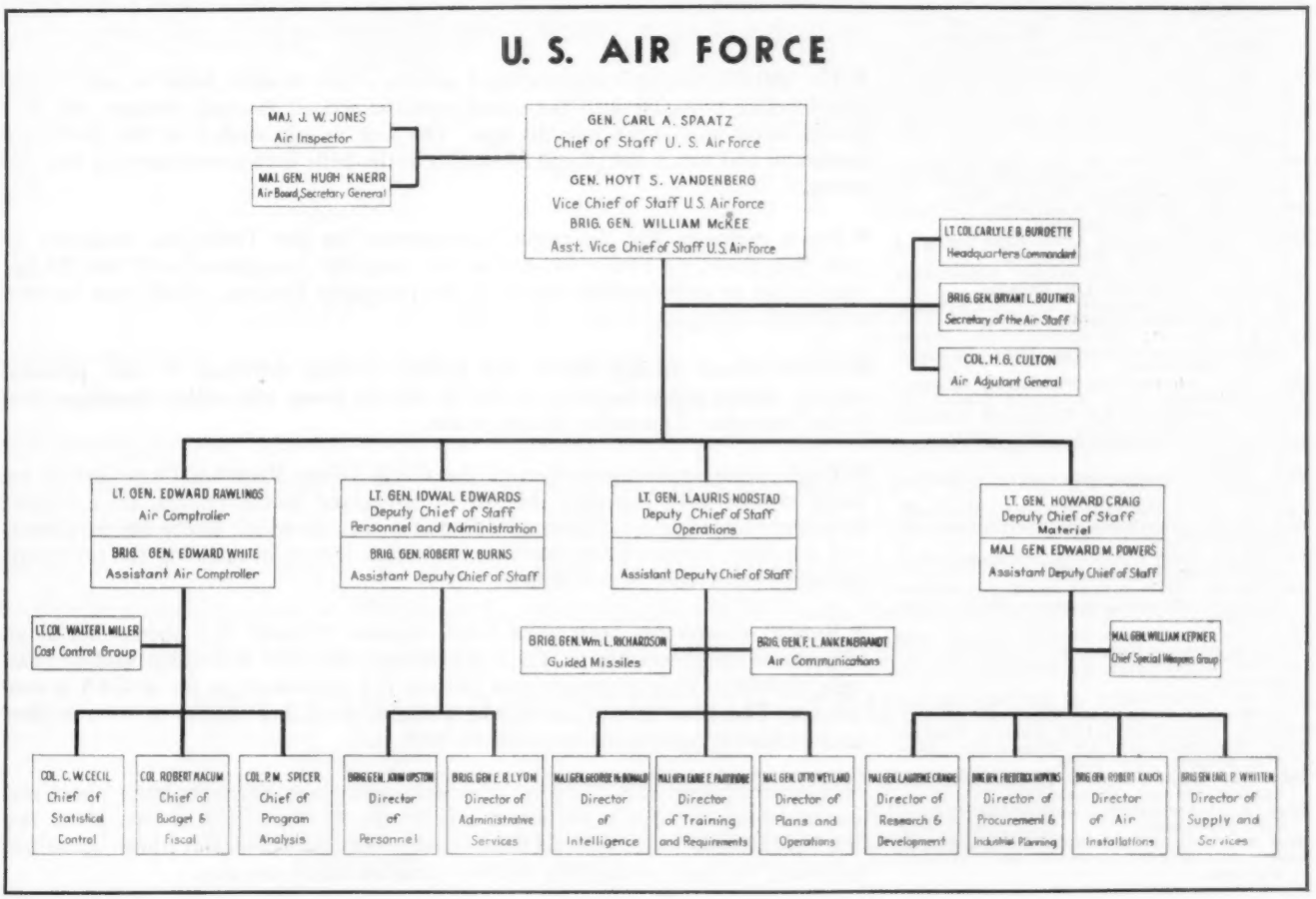
## Airport Rule Challenged By Buffalo Distributor

Objections to the rule set by airport director Nathaniel E. Duffy barring planes without radio equipment from landing at Buffalo Airport were voiced by F. Leslie Marsden, president of the Buffalo Aeronautical Co., before the Airport Advisory Board.

Marsden declared the ruling will keep hundreds of small planes out of the Buffalo Airport. He emphasized that the light system installed at the airport is adequate for planes lacking radio equipment.

## Cargo Terminal Sold

Continuation of independent cargo facilities at Detroit Airfreight Terminal, Wayne County Airport, has been assured with sale of the company to a new group headed by Richard D. Brooks and Howard F. Smith, Jr. The move averted the threat of termination of the terminal service arising from the announcement by National Airfreight Forwarders that it would cease operations.


U. S. AIR FORCE
MAJ. J. W. JONES
Air Inspector
MAJ. GEN. HUGH KNERR
Air Board, Secretary General
GEN. CARL A. SPAATZ
Chief of Staff U. S. Air Force
GEN. HOYT S. VANDENBERG
Vice Chief of Staff U.S. Air Force
BRIG. GEN. WILLIAM McKEE
Asst. Vice Chief of Staff U.S. Air Force
LT. COL. CARLYLE B. BURDETTE
Headquarters Commandant
BRIG. GEN. BRYANT L. BOUTNER
Secretary of the Air Staff
COL. H. G. CULTON
Air Adjutant General
LT. GEN. EDWARD RAWLINGS
Air Comptroller
BRIG. GEN. EDWARD WHITE
Assistant Air Comptroller
LT. GEN. IDWAL EDWARDS
Deputy Chief of Staff
Personnel and Administration
BRIG. GEN. ROBERT W. BURNS
Assistant Deputy Chief of Staff
LT. GEN. LAURIS NORSTAD
Deputy Chief of Staff
Operations
Assistant Deputy Chief of Staff
LT. GEN. HOWARD CRAIG
Deputy Chief of Staff
Materiel
MAJ. GEN. EDWARD M. POWERS
Assistant Deputy Chief of Staff
LT. COL. WALTER I. MILLER
Cost Control Group
BRIG. GEN. Wm. L. RICHARDSON
Guided Missiles
BRIG. GEN. F. L. ANKENBRANDT
Air Communications
MAJ. GEN. WILLIAM KEPNER
Chief Special Weapons Group
COL. C. W. CECIL
Chief of Statistical Control
COL. ROBERT HACUM
Chief of Budget & Fiscal
COL. P. M. SPICER
Chief of Program Analysis
BRIG. GEN. JOHN UPSTON
Director of Personnel
BRIG. GEN. E. B. LYON
Director of Administrative Services
MAJ. GEN. GEORGE McDONALD
Director of Intelligence
MAJ. GEN. EARLE E. PARTRIDGE
Director of Training and Requirements
MAJ. GEN. OTTO WEYLAND
Director of Plans and Operations
MAJ. GEN. LAURENCE CRAIGIE
Director of Research & Development
BRIG. GEN. FREDERICK HOPKINS
Director of Procurement & Industrial Planning
BRIG. GEN. ROBERT KAUCH
Director of Air Installations
BRIG. GEN. EARL P. WHITTEN
Director of Supply and Services

## Five Men Are Named To California Commission

Gov. Earl Warren of California has announced appointment of the five members of the California Aeronautics Commission, a group set up by the last session of the state legislature.

The commission is empowered to choose a $12,000-a-year director of aeronautics for the state.

Named to the commission were John Felton Turner, Oakland, chairman of the aviation committee of the Oakland Chamber of Commerce; David G. Fleet, San Diego, assistant to the president of Consolidated Vultee; Norman Larson, Burbank, owner of Pacific Aircraft Sales Co. and president of the California Aviation Trade Assoc.; Fred D. Fagg, Jr., president of the University of Southern California and former national director of the Air Law Institute, Chicago, and T. Bruce Church, Salinas, ranch owner who holds a pilot's license and makes extensive use of air shipment in marketing his vegetable products.

## AVIATION CALENDAR

**Nov. 10.** Robert J. Collier Trophy Committee, Washington.
**Nov. 14.** Brewer Trophy Committee, Washington.
**Nov. 18.** National Aviation Trades Association annual meeting, Springfield, Ill.
**Nov. 18-19.** Air Force—Navy—industry conference on propeller procurement specifications and drawings, Wright Field.
**Nov. 19-22.** Fifth Annual National Aviation Clinic, Springfield, Ill.
**Nov. 20.** Personal Aircraft Council meeting, Springfield, Ill.
**Dec. 1-3.** Air transport meeting, Society of Automotive Engineers, Hotel Continental, Kansas City.
**Dec. 1-3.** Fifth annual meeting, Aviation Distributors and Manufacturers Association, Hotel Adolphus, Dallas, Texas.
**Dec. 2.** Air Transport Association air traffic conference, Washington.
**Dec. 3.** Air Transport Association board of directors meeting, Washington.
**Dec. 3-4.** Aircraft Industries Association board of governors, Los Angeles.
**Dec. 4-5.** Air Transport Association meeting of members, Washington.
**Dec. 4-6.** Society for Experimental Stress Analysis, annual meeting, Hotel Pennsylvania, New York.
**Dec. 4-7.** International aviation celebration, El Paso.
**Dec. 5.** Meeting of Air Transport Association directors for 1948, Washington.
**Dec. 17.** Annual Wright Brothers Lecture, Washington.
**Jan. 9-11.** All-American air maneuvers, Miami.
**Jan. 13.** ICAO statistics division, Montreal.
**Jan. 15-18.** Southeastern soaring contest, Sanford, Florida.
**Jan. 26-28.** CAA non-scheduled operators of region four, Fort Worth.
**Jan. 26-29.** 16th annual meeting, Institute of the Aeronautical Sciences, Hotel Astor, New York.
**Mar. 22.** ICAO aeronautical maps and charts division, Brussels.
**Mar. 30.** ICAO personnel licensing division, Montreal.
**Apr. 20.** ICAO rules of the air and air traffic control division, Montreal.
**Apr. 27.** ICAO facilitation division, Europe.
**July.** International Air Exposition, Idlewild Airport, New York.
**July 15.** Ninth annual meeting, Airline Advisory Board, Kansas City, Mo.
**Sept. 3.** International Aeronautic Federation, Cleveland.
**Sept. 8.** ICAO operations division, Montreal.
**Sept. 21.** ICAO airworthiness division, Montreal.

# INDUSTRY OBSERVER

► **Northrop Pioneer will make a nationwide tour in December. New three-blade propellers are to be installed shortly to further increase performance. The tri-motor design will takeoff on two engines and fly on a single engine. Design studies and engineering have been completed on float and ski versions.**

► Curtiss-Wright XP-87, Air Force "all weather" four-jet fighter, will be trucked from the C-W Columbus, Ohio plant to Muroc, Calif. Although the plant runway is adequate for a takeoff and Wright Field is only 60 miles away Air Force and company engineers chose to delay the first flight until the 7-mile runways at Muroc can be used.

► **Douglas Aircraft Co., Inc. does not anticipate any further orders for the DC-6 transport from domestic airlines, although sales efforts will continue abroad. Donald Douglas believes that some form of international financing will be required before further DC-6 sales are assured. Total orders to date are about 140 and with 300 the "breakeven" figure to date. Douglas anticipates a $30,000,000 loss on the project.**

► Navy has taken delivery on the first Piasecki twin engine helicopter. During the delivery demonstration at Philadelphia five men climbed a rope ladder from the ground to the helicopter hovering at an altitude of 40 ft. Purpose was to test helicopter's utility for rescues at sea.

► **McDonnell Aircraft Corp. is working on a design study for ramjet powered helicopter blades.**

► Donald Douglas revealed to the President's Air Policy Commission that his plans to launch the DC-6, made several months before V-J day, were based largely on an Air Force statement that no C-54 transports would be declared surplus until at least one year after the end of the war. The AAF surplus declaration of C-54's shortly after V-J day made fatal inroads on the DC-6 sales program and has resulted in a large financial loss on the project.

► **The $80,000 British Vickers winged missile, which recently failed to reach sonic speed before plunging into the ocean, was the second aborted attempt, the first having been tried some months ago. The first missile fouled in the launching apparatus and struck the parent Mosquito in the belly before corkscrewing into the ocean.**

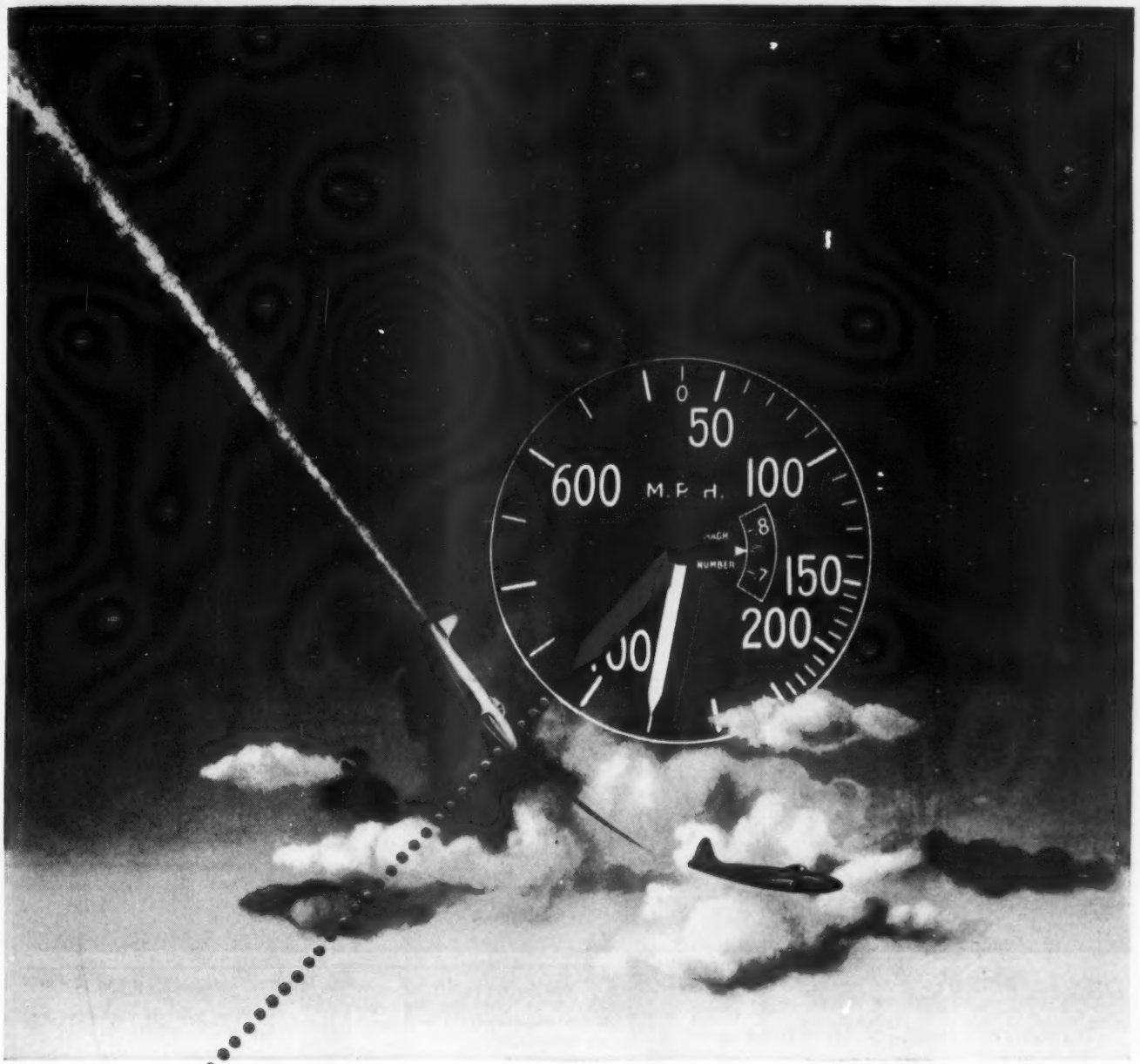
► Beech engineers like the engine arrangement on the Twin-Quad transport so well, they may try a similar two-engine one propeller arrangement with two 85 hp. engines on an experimental version of the four-place Bonanza, which now has one engine of 165 hp.

► **Trend toward linking aileron and rudder controls continues in new personal planes. Latest plane designed so that it may be flown with either hands or feet, is the four-place Luscombe Silvaire sedan.**

► Engineering recommendations of the Crash Injury Research Organization are being studied with increased interest by lightplane manufacturers, since reports of two crashes of 65 hp. planes of different makes, in which safety design wheels, and a folding forward front seat were important factors in enabling the occupants to escape with only minor injuries.

► **Braniff Airways has been given CAA approval to make ILS approaches at all airports on its system where ILS is operational with 200 ft. ceilings and one-half mile visibility. This represents rock bottom ILS minimums as far as CAA is concerned. The same minimums will be available for other airlines as soon as they gain sufficient operational experiences with ILS.**

► Howard Hughes' XF-11 photo-reconnaissance plane has completed phase one test at Muroc and has been turned over to the Air Force for its own phase two tests. A Hughes spokesman told AVIATION WEEK that the giant photo plane had exceeded Hughes' guaranteed performances in many respects.




**THE DANGER LINE** for present day high speed aircraft has been the speed at which the plane enters the supersonic shock-wave pattern — a speed which varies with altitude. An important part of Kollsman's development program for the past several years has been instrumentation for high speed subsonic and supersonic flight. Among the developments is the new Kollsman Mach Air Speed Indicator. The broad red pointer moving over the dial of this indicator reports critical speed as it changes with altitude and thus gives the pilot constant warning of the point at which the plane will enter the dangerous compressibility pattern. Operating airspeed is indicated by means of the white pointer on the same dial. The relationship of operating airspeed to the critical speed is, therefore, constantly apparent at all altitudes. On the mechanism which actuates the red pointer, settings are provided both for the proper Mach Number and the maximum operational speed for the particular design of aircraft being flown.

**KOLLSMAN AIRCRAFT INSTRUMENTS**

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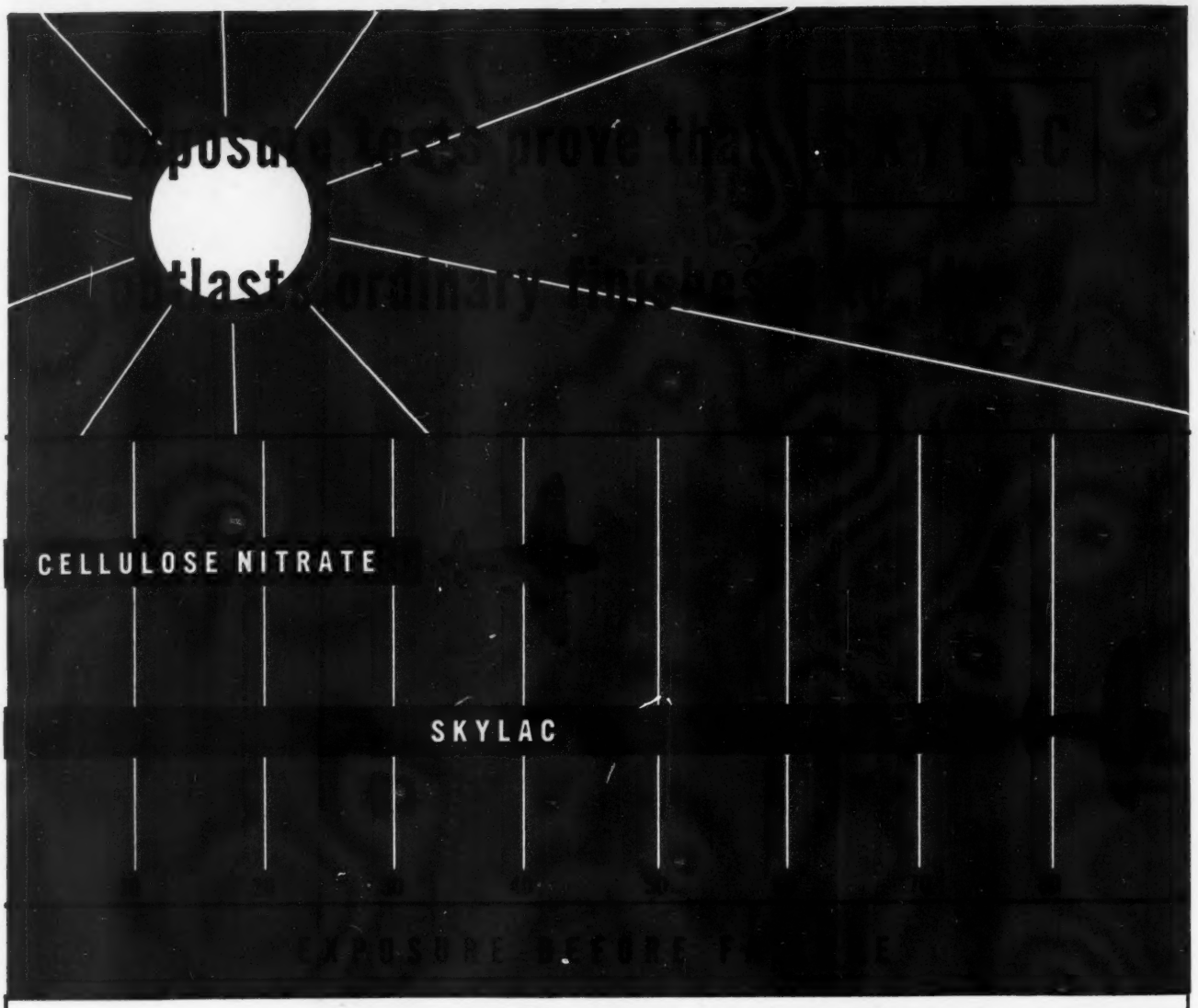


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# Douglas Forecast of Transport Market Renews DC-9 Speculation

**Potential sales put at 80-90 four-engine and 380-400 twin-engine planes, with estimate that 360 "DC-3 replacements" will be in use in 1950.**

By WILLIAM KROGER

With an estimate of a combined domestic and export market for transport aircraft in the next four to six years of only 80-90 four-engine and 380-400 two-engine planes above present offers, Donald W. Douglas has caused renewed industry speculation both as to his own company's plans and the future of transport plane projects now underway.

In a detailed analysis of the market outlook and the problems of commercial plane makers, prepared for the President's Air Policy Commission, Douglas pointed out that this number of planes would represent a very large order for any manufacturer. But as the industry is presently constituted, such an order would be split among "five to eight manufacturers."

► **No Profits**—On such a basis, it is obvious from Douglas' statement, no manufacturer could produce at a profit. According to the president of the company that has been the prime supplier of airline transports, the DC-6 to date has cost more than $42,000,000 in excess of revenut received from the delivery of about 80 planes. The firm will not reach the break-even point until the 300th airplane is delivered, Douglas states, "if all goes well."

That indicates hustling on the part of the Douglas sales staff, as the company-by-company and plane-by-plane breakdown of present plan shows DC-6s either delivered or still on order totaling but 136. Douglas' 80-90 plane potential would still leave his company some 70 planes short of the balance point.

► **Common Situation**—In varying degree, the same situation pertains to every other transport plane manufacturer, particularly in the twin-engine field, the break-down of planes in use and on order furnished by Douglas to the Commission puts Consolidated Vultee out in front in the twin-engine market with 177 Convair Liners on order (as of Sept. 1), with Martin down for 100 2-0-2s and 3-0-3s.

Both manufacturers, at times, have estimated they must each sell about 300 airplanes to break even. According to the Douglas calculations, the most they could sell together would be 400 planes. With an even split—200 more each—both would be in the clear. The possibility that such a goal cannot be attained and that the Convair Liner may have to be dropped or sold was hinted in the prospectus issued in connection with the sale of Convair non-aviation properties to a new company (AVIATION WEEK, Nov. 3).

► **DC-9 On Entry**—From the voluminous charts attached to the Douglas statement emerges another hint as to the possible future of twin-engine transport development. Douglas estimates that the market for this type of plane is 380-400. His forecast of planes to be used throughout the world in 1950 list a total of 320 Convair Liners, 2-0-2s and 3-0-3s—43 more than he shows on order as of Sept. 1. But listed under the category of "DC-3 replacement" is a total of 360 planes. The Douglas company does not regard the Convair or Martin planes as DC-3 replacements. But it does so class its own projected DC-9 (AVIATION WEEK, Aug. 11).

While this may be the tip-off that Douglas has decided to go ahead with the DC-9, in another part of his statement he cites a good reason for not following through. "Assuming," he states, "that it requires $5,000,000 to build a prototype DC-3 replacement and the cost of the first 100 airplanes averages $275,000 per airplane, each of the 100 must be saddled with $50,000 worth of development cost which brings the price to a level too high to sell.

"Assuming 200 as today's maximum sales potential for a new model, spread of a DC-3 replacement. . . . Costs would amount to $25,000 per airplane. . . . Not until sales approach 500 or 1,000 airplanes does the spread of $5,000,000 diminish to a tolerable portion of the total cost."

► **Financial Report**—Douglas' assessment of the problems of the commercial aircraft manufacturer assumes additional interest as it came almost concurrently with the issuance of his company's third quarter financial report. Considered with earlier reports of the Douglas fiscal year (which ends Nov. 30) and the statement to the Air Policy Commission, this report reflects the imponderables a manufacturer faces when attempting to gauge a market for commercial aircraft.

When Douglas issued the second quarter report last spring, he anticipated that before the end of the year a small profit would be realized on the sale of each DC-6. As Douglas accounting practice generally has been to charge development and production costs pro rata to each plane delivered, this would mean a much earlier amortization of the DC-6 program than is envisioned in the statement to the Commission (wherein break-even point is put at 300 planes vs. the 136 now delivered or on order).

For the first nine months of the current fiscal year, the Douglas loss has been $1,170,037 after provision for tax carry-back credits. The loss jumped from $107,109 in the first quarter to $645,198 in the second quarter. Third quar-

## Transport Line-Up

Donald Douglas, in his statement to the President's Air Policy Commission gave the following figures on new transports either delivered or still on order as of Sept. 1:

Boeing (all on order): 55 Stratocruisers, 48 for international and foreign service, seven for domestic service.

Convair (all on order): 177 Liners, 62 for international and foreign service, 115 for domestic service.

Douglas: 64 DC-6s delivered, 20 for international and foreign service, 44 for domestic service; 72 on order, 48 for international and foreign service, 24 for domestic service.

Lockheed: 109 Constellations delivered, 82 for international and foreign service, 27 for domestic service; 13 on order, 12 for international and foreign service, one for domestic service (Delta).

Martin (all on order): 100 2-0-2s and 3-0-3s, 50 for international and foreign service, 50 for domestic service.

ter loss was lower, $417,730. This covers operations up to Aug. 31 at which time, according to the data submitted to the Air Policy Commission, 64 DC-6s had been delivered. For the final three months of the fiscal year, deliveries should total about 40 more airplanes.

▶ **Greater Loss Foreseen**—The outlook, due to increased costs, probably has changed greatly since Douglas indulged in optimism last spring. Reverting to his usual caution in the third quarter report, he comments that the final quarter may increase the loss.

For the first nine months, Douglas sales aggregated $92,568,384, up 10 percent over the similar period of 1946, although the operations last year yielded profit of $3,454,142. Backlog declined to $156,467,000 at the end of the third quarter from $165,039,000 three months earlier.

The drop in backlog results from production outstripping sales, a condition that prevailed for Douglas in the second quarter also, although in far worse degree. While third quarter deliveries totaled $38,034,000, new orders less cancellations amounted to $29,462,000. In the second quarter new business was only $3,054,000 and deliveries $38,553,000.

## Boeing Schedules 26 Planes by Jan. 1

Boeing Aircraft Co. has established a production schedule calling for three YC-97As, three Stratocruisers and 20 additional B-50s to come out the factory door by Jan. 1, according to H. F. Brown, vice president in charge of production manufacturing.

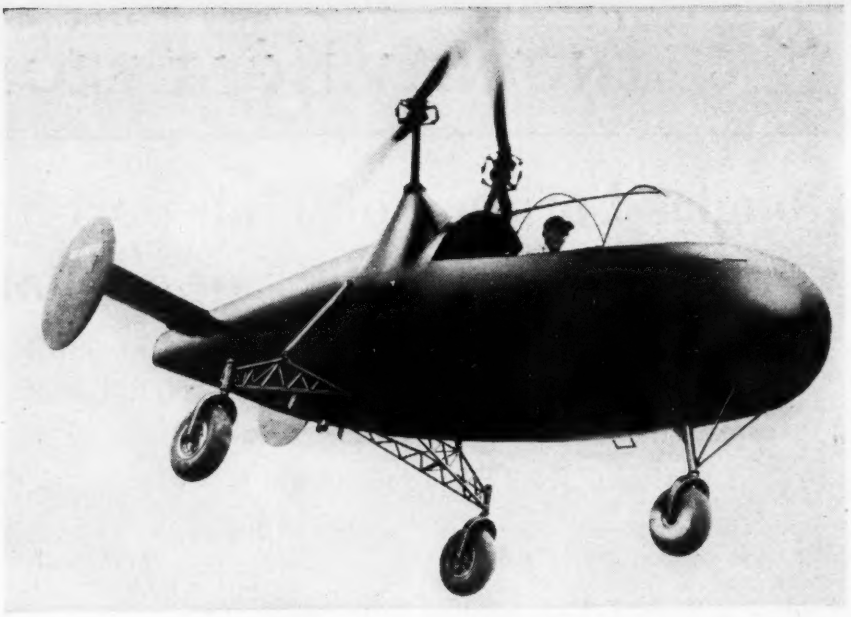
More than 2,500 workers have been added to the payroll in the past month, bringing the total payroll above 15,000.

The B-47, newest Boeing plane, is expected to make its first flight before mid-November. On low-speed taxi runs the jet bomber has been put through a series of sharp "S" turns to learn how well the unconventional tandem landing gear would stand up under punishment, and to check design criteria of the outrigger struts.

"We learned that neither these nor wing-tip clearance will be critical factors," said Bob Robbins, test pilot. "The wing tips remained well above 18 in. off the ground, and the gear itself stood up beautifully."

The two outboard engines have been run three and a half hours each, and the four inboards two hours each. Before installation on the plane, all were operated on the test rig.

One additional test was the firing of a single jato bottle, which proved there are no temperature problems connected with its operation. Before flight, from three to nine jato units will be fired simultaneously.



## Navy Contracts With Kaman For 'Copter Development

Navy interests in helicopter development of the Kaman Aircraft Co. has culminated in a $15,000 contract by the Navy's Bureau of Aeronautics calling for design data, construction, test, stress analysis and engineering reports of the Kaman rotor and control system developed and flown by the Corporation on its experimental model K-125-A helicopter. Work on this contract is already under way at the firm's Bradley Field plant.

A new three place model designated the K-190-A has progressed to the point where flight tests are scheduled for late next month. The K-190-A is powered by a 185 hp. Lycoming engine, carries 32 gal. of fuel and has a range of 300 mi. High speed is 100 mph. and cruising speed is 80 mph. Gross weight is 2,300 lb.; rotor diameter is 38 ft., and the fuselage is steel tubing covered with a metal skin, wheel tread is 8 ft. 5 in.

## Fairchild's Process Licensed to National

National Bronze and Aluminum Co. has received a license from Fairchild Engine & Airplane Corp. for the use of its Al-fin process for bonding aluminum or its alloys to steel and iron.

The Al-fin process makes possible the fabrication of bi-metallic assemblies combining the strength of steel with the light weight, high heat conductivity, excellent bearing qualities, and anti-corrosion qualities of aluminum.

The Cleveland foundry intends to use the process in making bi-metallic pistons, steel-backed aluminum sleeve bearings and bushings, aluminum timing gears with bonded-in steel hubs, muffed and finned cylinder barrels, finned heat exchangers, as well as aluminum coating of steel pipe for tubing for corrosion prevention.

## Dutch Inventor Designs Helicopter To Loop

A twin-rotor helicopter capable of diving and looping has been designed by E. Van Dijk, of Rotterdam. At present he is seeking financial assistance to construct a prototype in the Netherlands.

Van Dijk has applied for a patent on the stabilization system, which he claims is the key to the novel characteristics, but details have not been disclosed.

The design now calls for a two-place helicopter, but the inventor has plans for a four-place and possibly a six-place craft. The two-place, to be designated the HVD 101, could be constructed in the Netherlands within five months at a cost below the price of imported helicopters, he estimates.

According to present plans, the HVD 101 would have a maximum speed of about 130 mph. and would cruise at about 104 mph. Range would be about 350 mi., useful load about 2,000 lb. It would be powered by a 60 hp. engine.

## Continental Reports Loss

Continental Motors Corp. reports net loss of $54,779 after application of estimated tax refund for the quarter ending July 31. C. J. Reese, president, stated operations since have been on profitable basis, which should continue. First half losses totalled $676,209.

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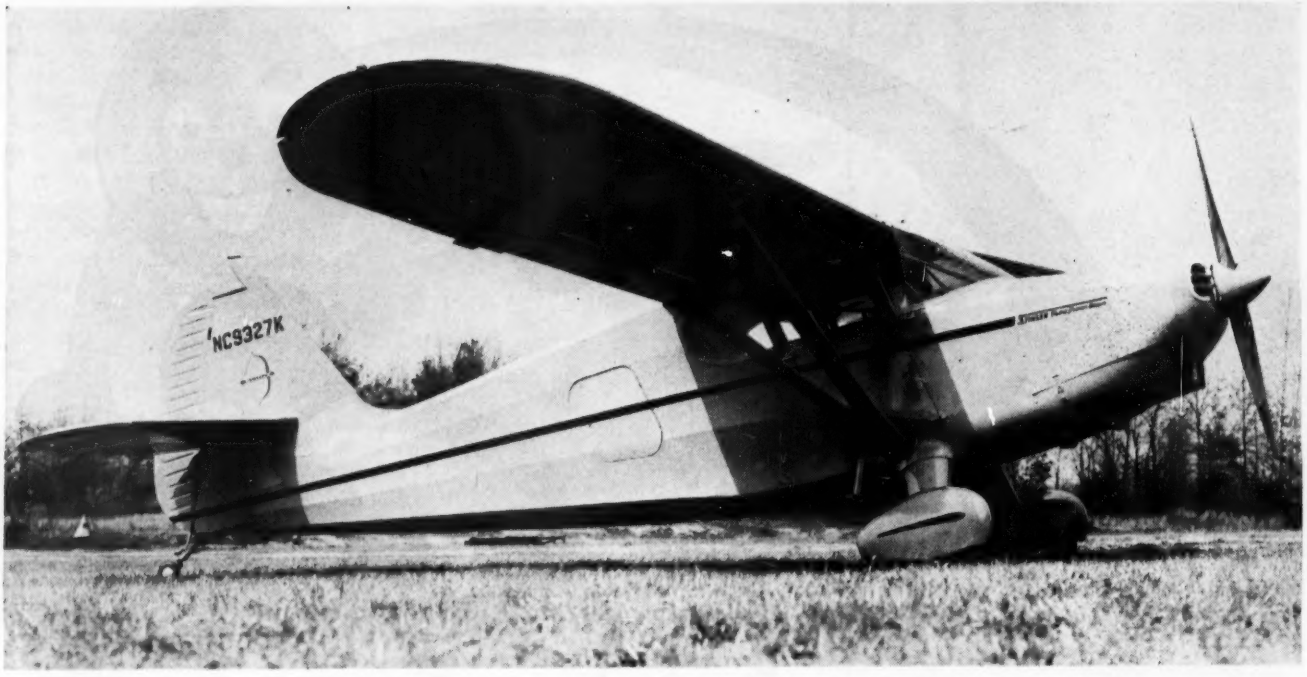



**OLD: 1947 Station Wagon Stinson has lower vertical stabilizer and no adjustable rudder trim. The aircraft uses single fore-and-aft antenna for sending and receiving. No major changes are in sight.**

# Stinson Refines Voyager for 1948

## While no radical changes are made, new model has slightly greater speed and load, with larger tail giving smoother ride.

Stinson, undisputed leader in sales of four place aircraft, announces its 1948 models of the Voyager and Flying Station Wagon featuring the highest useful load and the lowest list price of any comparable plane now on the American market.

Prices for the 1948 Voyager and Flying Station Wagon are given as $5,889 f.a.f. (fly-away-factory) and $5,989 f.a.f. respectively (about $40 more than last year's prices). A newcomer to this field, the Luscombe Silvaire Sedan (not yet licensed), is expected early next year and will probably sell for about $6,000.

Comparison of the 1946, '47, and '48 models indicates that Stinson evidently has no intention of making any radical changes in the Voyager. Modifications are limited to numerous refinements but the basic airplane remains practically unchanged.

▶ **Performance Gain**—Improvements in performance appearing this year are increased range and load capacity. Modifications have resulted in an improvement of the cruising range amounting to about 22 percent, with the cruising speed increased from 125 to 130 mph. Takeoff distances, depending upon gross weight vary from 295 ft. to 526 ft. using the standard propeller. Useful load capacity for 1948 is 1,106 lb., an increase of 100 lb. over previous models.

Installation of larger rudder and vertical fin, and use of rudder trim results in smoother riding qualities and easier handling for the pilot.

▶ **Seats Redesigned**—To assure maximum passenger comfort Stinson engineers have designed new seats. Front seats are adjustable and seat backs fold flat permitting easy access to the rear part of the cabin; the rear seat has been made three inches wider with lower knee rests, more foot room, headrests, and form fitting sling-type cushions.

**Comparative Specifications Stinson Voyagers 1947-48**

| | 1947 | 1948 |
|---|---|---|
| Span | 34 ft. | 34 ft. |
| Length | 24 ft. 6 in. | 25 ft. 2 in. |
| Height | 7 ft. | 7 ft. 6 in. |
| Gross Weight | 2,230 lb. | 2,400 lb. |
| Empty Weight | 1,224 lb. | 1,294 lb. |
| Useful Load | 1,006 lb. | 1,106 lb. |
| Engine(Franklin) | 150 hp. | 165 hp. |
| Maximum Speed | 133 mph. | N.A.* |
| Cruising Speed | 125 mph. | 130 mph. |
| Takeoff Distance (S.L.) | 620 ft. | 526 ft. |
| Initial Climb (S.L.) | 650 fpm. | 580 fpm. |
| Range (5,000 ft.) | 500 mi. | 554 mi. |
| Fuel Capacity | 40 gal. | 50 gal. |

* Figures not available.

Extra heater ports have been added in the cabin so that heat is more evenly distributed. Heat flow is regulated from a push-pull control on the instrument panel. Additional fresh air vents have been installed so that each passenger may regulate the amount of fresh air he desires. These vents are a standard pull down type which may be rotated to direct flow of air.

▶ **Better Insulation**—Sound level in the cabin is greatly reduced by soundproofing with Fiberglas blankets installed throughout. Engine exhaust system mufflers further reduce the noise level to such an extent that an overhead loudspeaker may be used with the radio, permitting all passengers to enjoy radio reception during flight.

The rear cabin window has been enlarged to provide better visibility in the

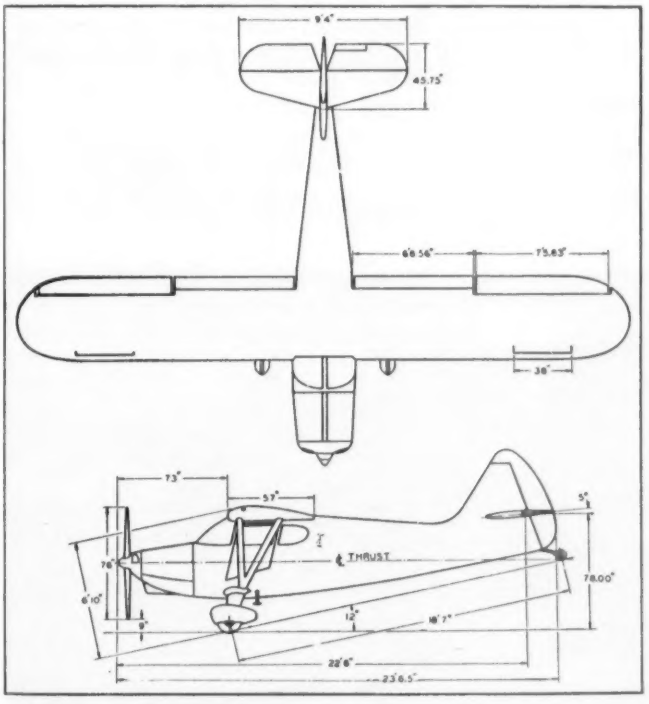
**NEW: 1948 Stinson Flying Station Wagon, showing larger tail section, with adjustable rudder trim. New type Vee antenna extends from tail to wing tips. New seats have also been designed.**

air and while taxiing.

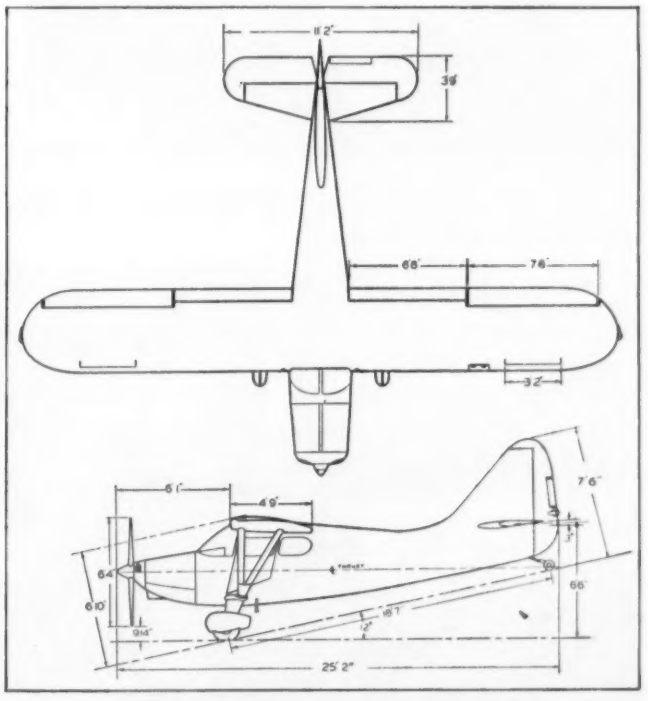
Provisions have been made for the installation of VHF, a marker beacon receiver, and a rotatable loop antenna in case owners wish to have such equipment installed.

► **Panel Arrangements**—Three instrument panel arrangements are available, the standard flight panel includes an altimeter, airspeed indicator, and a compass; the basic blind flight panel includes a bank and turn indicator, vertical speed indicator, and a clock; for full instrument flight, in addition to the four basic flight instruments, an attitude gyro, a directional gyro, and a direction indicator are added. Vacuum for the gyros is obtained from two venturi tubes.

Other optional equipment items include pontoons for water landings and skis for snow use and provide triple utility and year 'round availability for the operator.

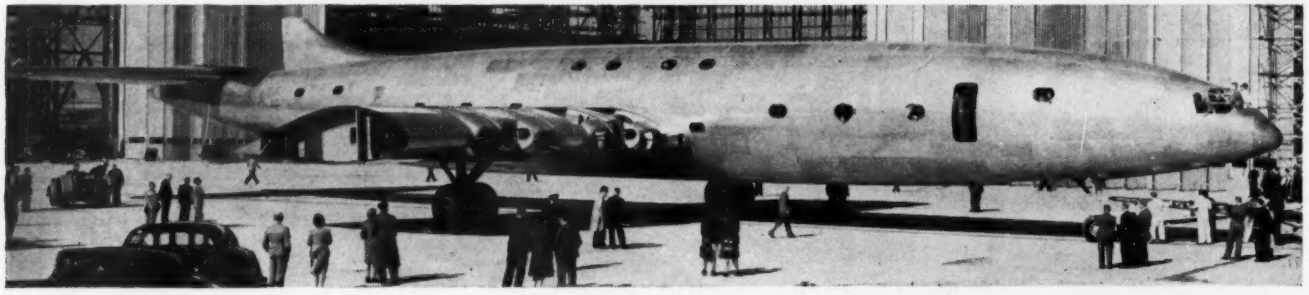



**OLD: Showing dimensions of earlier (1947) model, note that both models have similar wing contours and wheel tread, but this model has lower and smaller empennage.**

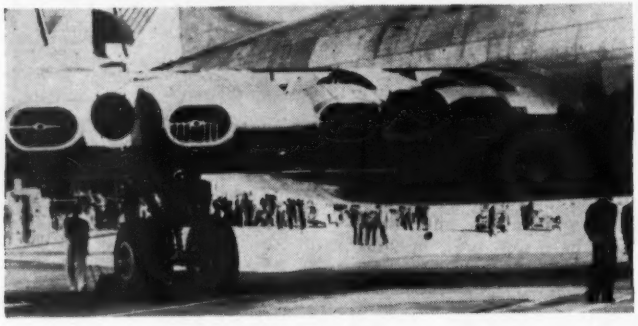



**NEW: 1948 Model shows little change in general outline except for unusually large tail section. Rudder trim tab is clearly indicated. Horizontal stabilizer size also increased.**

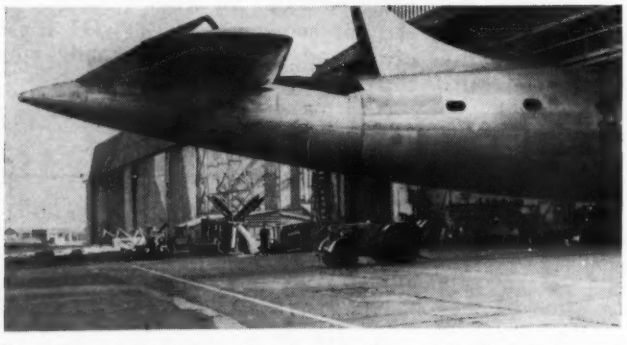
# NEW AIRCRAFT



Extreme fuselage length of the Brabazon I shown outside new assembly shop prior to installation of outer wing panels and rudder.



Closeup of the starboard engine section. Each engine of pair, buried in wing, will drive a component of common propeller shaft which will project through hole between intakes.



Near view of the tail section gives an idea of the size of the completed structure. Empennage surface area will be 1,795 sq. ft. (All photos, McGraw-Hill World News)

## Assembling a Behemoth

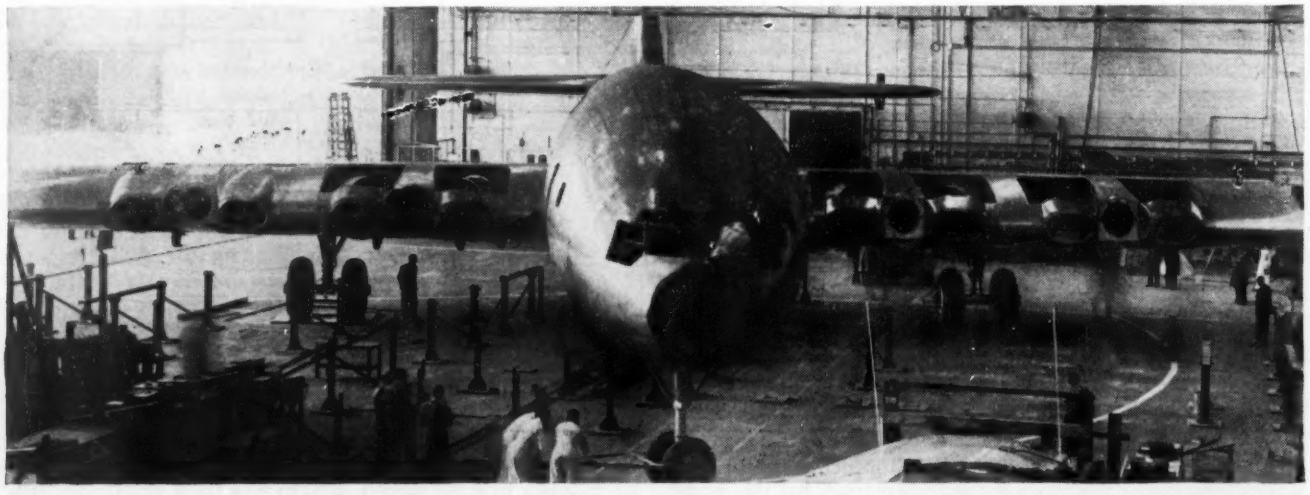
Britain's largest aircraft, the Bristol Brabazon I, rapidly outgrew her original quarters at the Filton Aerodrome and has had to be moved to specially built assembly shops.

This first plane, with a wing span of 230 ft. (same as that of the Consolidated Vultee B-36) and a length of 177 ft., will be powered by eight Bristol Centaurus 18 cylinder sleeve-valve radial engines giving a total takeoff power of more than 20,000 BHP. It will be the only one of its type fitted with reciprocating engines as production models will utilize Bristol Proteus turboprops of considerably higher power output, giving the plane correspondingly increased performance.

The Brabazon is a high altitude, long range, low wing monoplane with a wing divided into three sections consisting of center section and inner and outer panels. Maximum depth of wing is 6 ft. 6 in. Fuselage has a maximum diameter of 16 ft. 9 in. The span of the tail is 75 ft. and the height of the rudder is over 50 ft.

▶ **Great Weight**—At its design gross weight of 285,000 lb. the prototype will have an initial ceiling of 25,000 ft. which will increase as fuel is consumed. Maximum high speed will be in excess of 300 mph. and an economical cruising speed of 250 mph. at 25,000 ft. is expected. Range is given as 5,000 miles.

Cabin will be pressurized, humidified and air conditioned to insure passenger comfort at all altitudes. Passenger capacity will be 70-100 sleeping passengers by night and 120 seated passengers on daylight flights, plus a crew of 12 including 5 stewards.



Front view clearly shows novel arrangement of engine nacelles. Each pair of engines will drive one contra rotating propeller.

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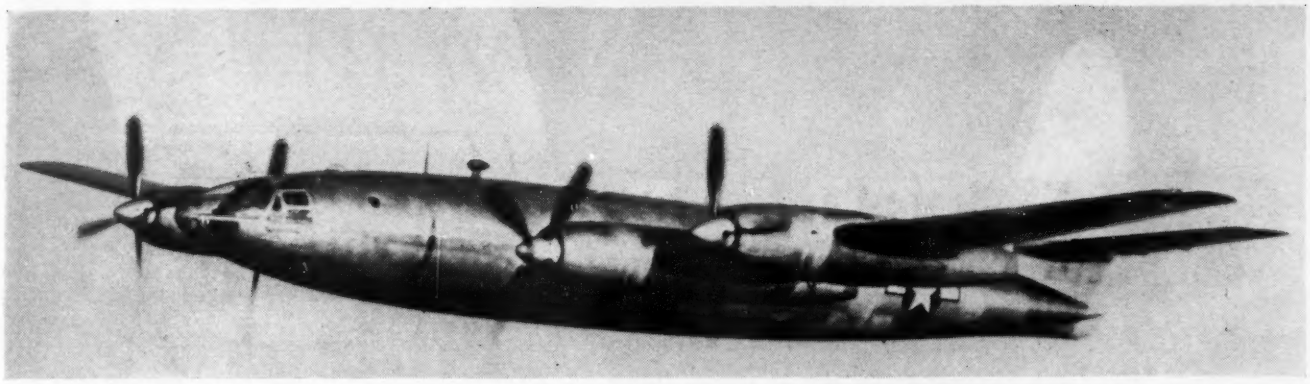


The sharp nose and cylindrical cigar shape of the XF-12 fulfills a designer's dream of no compromise with aerodynamic considerations.

***Design Analysis***

# F-12 Based on Fighter Experience

## Republic's photo plane, outgrowth of same competition that bore XF-11, has exceptional high speed and long range characteristics.

By ROBERT McLARREN

Award of a contract by the U. S. Air Force for 20 Republic F-12 long-range photo-reconnaissance aircraft, a sudden recloaking of the plane in the dark folds of security and its re-designation as a "secret mission" type have brought this radical plane into sharp focus.

Capable of operating at 45,000 ft. at a speed of 470 mph. over a range of 4,500 miles; newly modified with increased "all-weather" equipment and fitted with a new power plant development providing short bursts of extreme power, the F-12 has suddenly assumed tremendous importance in the eyes of both the United States Air Force and the State Department.

▶ **Intelligence Weapon**—The ability of the F-12 to obtain photographs, both in daylight and under conditions of restricted visibility, at high altitudes over long ranges with great speed, renders it a potent intelligence weapon. Operating from northern bases (Alaska, Canada), this "flying photo laboratory" is capable of mapping broad stretches of territory in the Arctic regions and pinpointing new construction and movements of men and equipment with near-invulnerability.

The sorbiquet, "Rainbow," on its airline counterpart assuredly belies the strategic potentialities of the Republic F-12.

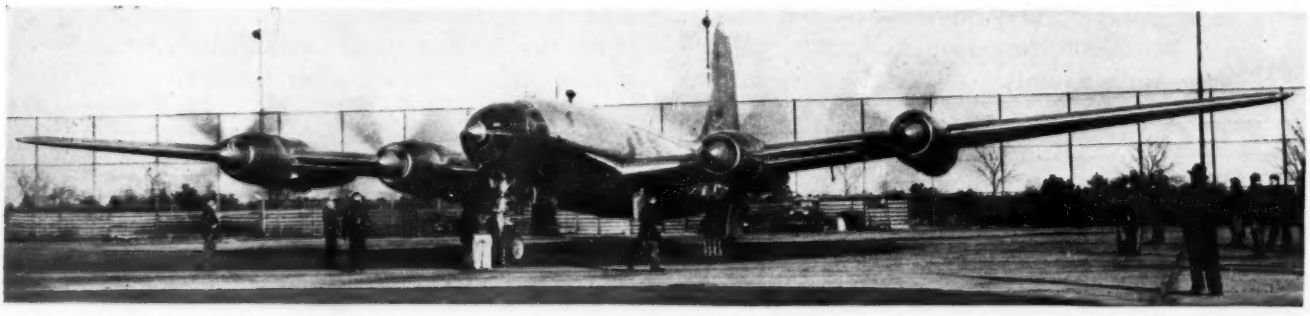
It was born at the same time and in the same manner as the Hughes XF-11 (AVIATION WEEK, Oct. 13) in response to a pressing need for speed, ceiling and range in a photo-recon. type designed specifically for the purpose. Col. Elliot Roosevelt's recommendations in August, 1943, were integrated into a basic design specification prepared by the Photographic Section of the Air Technical Service Command at Wright Field.

Alexander Kartveli, Republic Aviation Corp.'s vice president and chief engineer, studied the requirements exhaustively and concluded that the requested performance could only be achieved by a four-engine design using the new Pratt & Whitney Wasp Major engine supercharged to provide full military power at 40,000 ft. Any other combination, design studies showed, failed either in speed, range, rate-of-climb or ceiling.

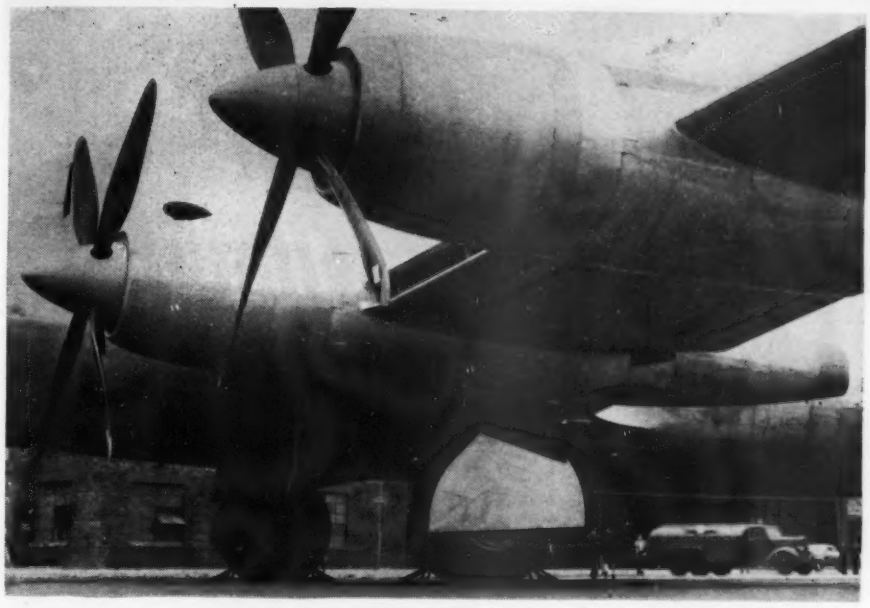
▶ **First Contract**—Kartveli's design staff prepared a proposal and on January 29, 1944, Republic received a "go ahead" from Wright Field. In March, 1944, contract W33038 AC 2135 was awarded calling for the delivery of two XF-12 aircraft at a cost, including spares, readjustments, etc. of $6,545,669 and a fixed fee of $258,985.

By June, 1944, the completed mock-up had been inspected and approved by the AAF's "689" Board and the prototype was completed in December, 1945. First flight of the XF-12 was made on February 4, 1946, with Lowry Brabham, test pilot, at the controls and Oscar P. Hass and James Creamer as crew.

Extensive Phase I (company) flight tests ensued for more than a year and this past June the XF-12 was turned over to AAF flight test officers at Wright



The air intakes in the leading edge of the wing created problems that were solved in a specially-constructed wind tunnel.



**The XF-12's nacelles is one of the striking features of the plane. These were the result of fighter design, and their extreme length helps to reduce drag.**

Field for Phase II (AAF) flight tests.

After only a few hours of flight tests, on July 10 the heavy craft was brought into a landing that sheared the right main gear. A landing was subsequently made on left main gear and nose wheel which severely damaged the airplane but it has been declared repairable.

The second XF-12 made its first test flight at Farmingdale, Long Island, on August 12 with Oscar Hass, L. R. "Pete" Collins and James Creamer abroad. Following completion of company flight tests the second plane will be delivered to Wright Field for more Air Force acceptance tests.

▶ **Fighter Design**—Throughout the design of the XF-12, low-drag was a primary consideration and many of its features were taken directly from Republic's considerable experience with fighter plane design. The maximum wing thickness was determined by the main wheel size in the retracted position and this required a section 17½% thick at the root, which was tapered to a 12% section at the tips.

The required high speed plus a high wing loading (62 lbs. per sq. ft.) required a wing with a critical Mach number of not less than 0.7 (corresponding to 532 mph. under standard conditions) at a lift coefficient of 0.3.

Since laminar flow sections then available could not meet the requirements, Kartveli and his staff developed a special section with an elliptical leading edge, a maximum thickness location of 40% at the root and 45% at the tip and a straight trailing edge. The wing is twisted 4% linearly to provide prior stalling of the inboard region.

• **Nacelles**—The most striking feature of the XF-12 is the engine nacelle installation, selected on the basis of fighter design in which a right-angle intersection of wing and fuselage provides minimum interference. The nacelles of the XF-12 extend well aft of the wing trailing edge, producing a high fineness ratio with accompanying low drag. By placing all air intakes in the wing leading edge, the front of the nacelle was left free of protuberences, aiding the high fineness ratio and preserving laminar flow.

• **Flaps**—The NACA double-slotted flap was developed for the XF-12 to preserve good airflow and produce a high lift coefficient in the "flaps down" position.

This design consists of a small, auxiliary airfoil located on the flap leading edge in such a manner that the incoming flow from the slot created by lowering the flap is directed through a second slot created by the auxiliary airfoil over the upper surface of the flap, thereby preserving the flow and preventing turbulence.

• **Leading Edge Air Intake**—The decision to take aboard all air through openings in the wing leading edge made the design of these intakes of critical importance. All of the area between the nacelles, comprising about 25% of the total span, is fitted with inlets.

To determine the correct lip shape a special wind tunnel model was built on which exhaustive tests of various configurations were conducted, the resulting design permitting the wing to reach its normal maximum lift coefficient and to recover about 98% of total ram pressure, a remarkable accomplishment.

• **Fuselage**—In an extremely rare case of design direction, absolutely no compromise with aerodynamic considerations was made in the shape of the XF-12 fuselage. The long, pointed nose of the design virtually prohibits flow separation. The resulting problem with vision, particularly during the landing approach, was resolved by the use of a double windshield: the conical halves of the enclosure sliding down into the fuselage to reveal a conventional "sharp break" windshield for use in bad weather. In normal flight, vision forward is directly through both windshields.

• **Empennage**—Both vertical and horizontal surfaces have a high aspect ratio to obtain maximum effectiveness. The horizontal stabilizer has a dihedral angle of 6° to raise it above the turbulent wing wake and prevent buffeting. On the basis of unsatisfactory experience during the war with fabric covered control surfaces, the XF-12 surfaces are metal covered and feature a sealed type aerodynamic balance, which prevents the passage of air through the gap between the control and the surface to which it is attached.

All controls of the XF-12 are spring-tab operated, being used in preference to hydraulic boost systems with their dangers in the event of hydraulic system failure. In the spring-tab system, pilot effort goes directly into an arm to which a spring and a control tab are attached, the spring alleviating the surface hinge moment.

• **Power Plant**—To provide the supercharging required for full military power at 40,000 ft., two exhaust-driven turbosuperchargers are mounted on each engine nacelle with their axis horizontal. By directing waste gate gas directly to the rear through jet nozzles, up to 10% of the cruising power of the engine at 40,000 ft. is recovered in useful thrust energy. A further utilization of this exhaust gas may be gained by an afterburning system in which fuel is injected directly into the tailpipe. This system affords up to 100% increase in thrust for short bursts of power.

To maintain the engine nacelle nose as small as possible, engine-driven cooling fans are mounted in the nacelle intake to provide adequate engine cooling

**REPUBLIC XF-12**

**Four 3,500 hp. P&W R-4360-31**

| | |
|---|---|
| Span | 129 ft. 2 in. |
| Length | 93 ft. 10½ in. |
| Height | 28 ft. 4 in. |
| Empty Weight | 65,000 lb. |
| Gross Weight | 101,400 lb. |
| Maximum Speed | 497 mph. @ 45,000 ft. |
| Cruising Speed | 470 mph. @ 40,000 ft. |
| Ceiling | 49,000 ft. |
| Range | 4,500 miles |
| Crew | 7 |

during climb and at high altitude. Intercoolers cool the air from the turbosupercharger before it is directed into the carburetors. All exit cowl flaps, which are of the sliding type, are automatically controlled by thermostat and require no attention from the pilot.

All fuel is carried within the wing between the main spars. Normal capacity is 4,350 gal. and a maximum of 5,570 gal. may be carried, sufficient for a range of 4,500 miles.

▶ **Design Criteria**—The XF-12 was designed for a diving speed of Mach number 0.8 (about 610 mph. standard conditions), and to prevent exceeding this a dive flap 7 in. wide located along the wing under surface near the leading edge is installed.

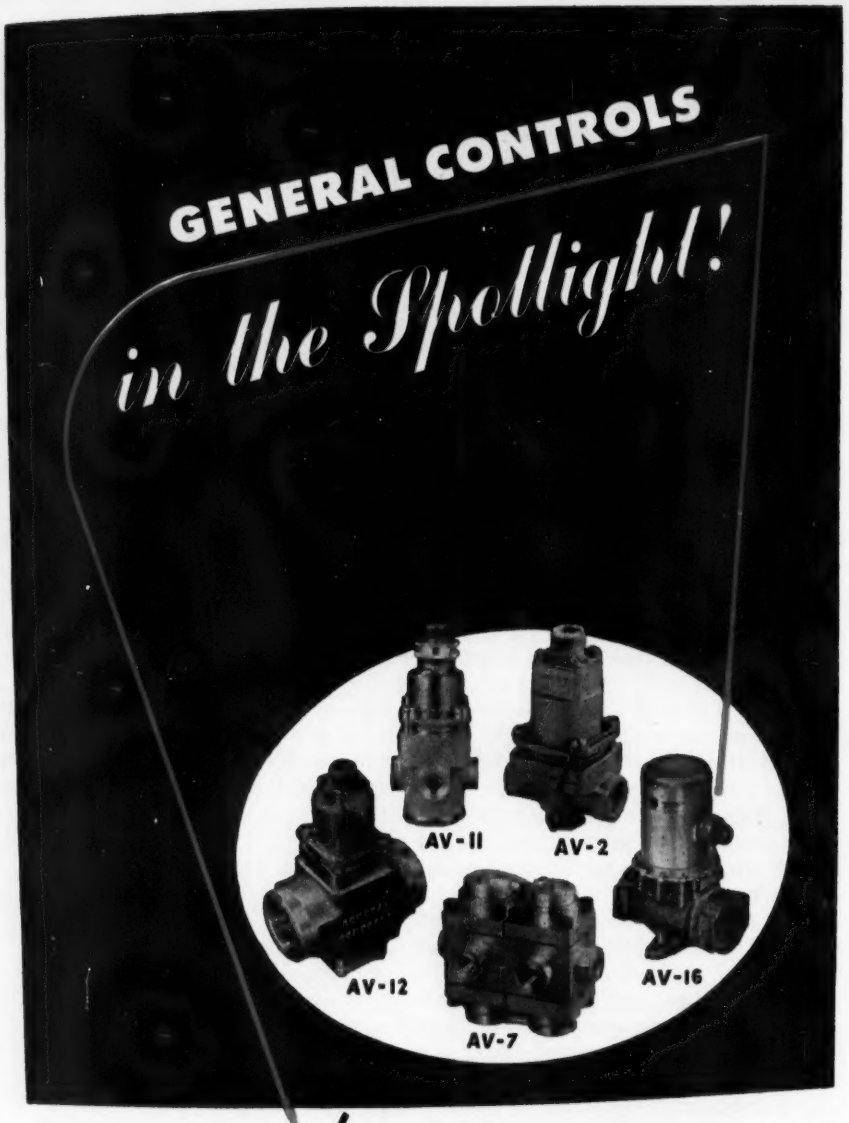
The high performance of the design made it impossible to use standard load factor definitions. For example, present requirements specify a maximum diving speed of 1.25 times the design cruising speed. While this factor is adequate for airplanes in the 300 mph. class, the maximum cruising speed of the XF-12 of 490 mph. multiplied by this 1.25 factor gives 612 mph., which, at 30-40,000 ft., corresponds to a Mach number of 0.92, considerably above the 0.8 of the XF-12. Entirely new analytical methods were developed for the XF-12 based on "time to reach diving speed from upset."

▶ **Construction**—Because its mid-wing design prohibits continuous spars, the main wing-fuselage joint of the XF-12 consists of two heavy main frames to which the spars are attached. Each frame is a double bulkhead with the spars sandwiched in between, the frames carrying the spar bending and shear stresses around large doorways.

Material used throughout the XF-12 structure is 75 ST dural. The fuselage is completely pressurized to a differential of 14.7 lb. psi. and is circular in cross-section throughout. The pressurized compartment extends from the windshield to the rear of the cabin and includes the compartments below the floor.

▶ **Equipment**—The XF-12 carries a large variety of photographic equipment, including complete dark room facilities to permit the development and printing of films in flight. Three separate photographic compartments are included. A large hold in the belly accommodates 18 high-intensity photo-flash bulbs to permit night photography.

Camera equipment provisions include virtually any combination of Air Force types presently available of split-vertical, trimetrogon, vertical view finding equipment, etc. Complete radar navigational equipment is carried including special equipment to permit night photography of radar indicated topography and details.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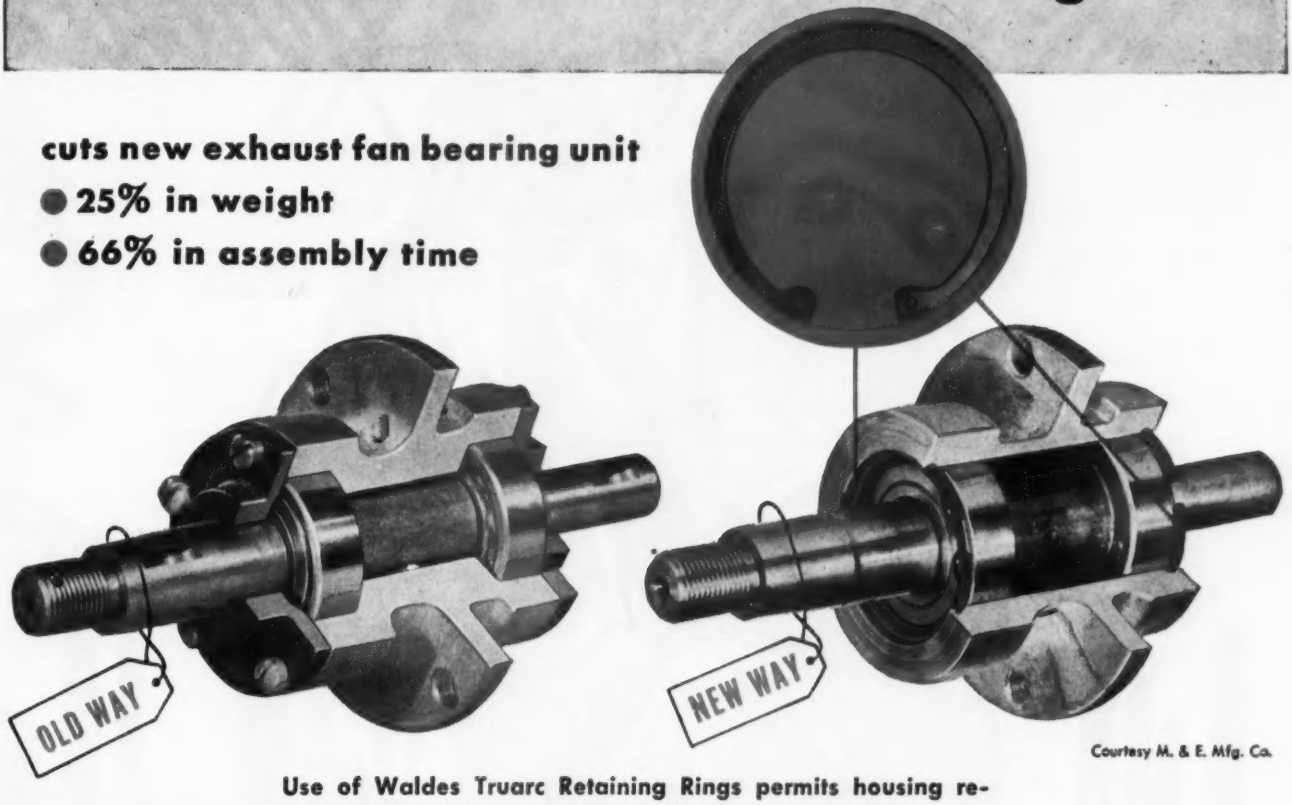


Courtesy M. & E. Mfg. Co.

**Use of Waldes Truarc Retaining Rings permits housing redesign—eliminates heavy cast bearing caps and screws requiring drilling and tapping; lowers labor and material cost.**

"TRUARC PAYS DIVIDENDS IN SAVINGS!" declares M. & E. Manufacturing Company, of Indianapolis, makers of exhaust fans for industry. "Improvements in design made possible by Waldes Truarc Retaining Rings provide a quieter, freer-running assembly, assure longer life to the entire unit, eliminate the hazards of uneven unnecessary pressure on the bearing and minimize future service requirements. In our experience Truarc has definitely proved itself the better method for doing an important job."

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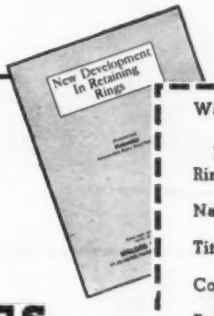


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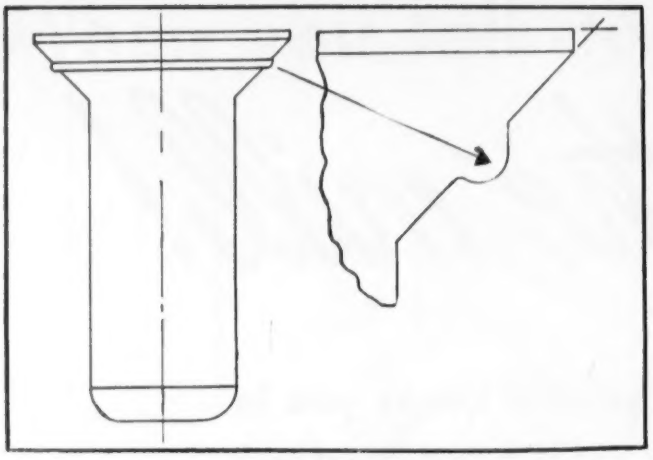


Fig. 1. Boeing Seal Ring Rivet—a self-sealer—has bead which is flattened into surface defects of countersunk hole.

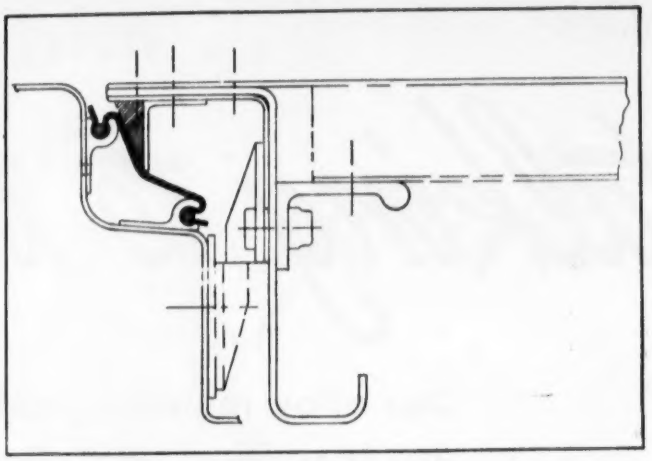


Fig. 2. Door and hatch seal—easily replaceable sheet or strip material—is held against locating blocks and inflated by cabin pressure.

# Fine Points of Sealing Pressurized Plane

## Potential leak sources identified . . . Role of rivets evaluated . . . Sealant materials analyzed.

Transition from low to high altitude aircraft, with attendant requirements for pressurization, has caused engineers to consider basic changes in design. Many of these are concerned with the overall configuration of the fuselage; others—equally important but not always so apparent—are found in detail design.

As disclosed by Boeing Staff Engineer A. A. Soderquist at the company's recent symposium on high altitude flying, the basic configuration of the fuselage must be such that pressurization does not result in bending loads which tend to change its shape and induce large deflections causing breakage or creepage of air-sealing materials.

Basically, the fuselage should be a surface of revolution around the straight axis, or be constituted of segments which are in themselves surfaces of revolution. Any local deviations from a natural surface of revolution must be heavily reinforced to carry resultant bending loads without deflections. This design factor is analogous to the difference between the design of an unpressurized landplane and a flying boat bottom or integral fuel tank in that for the two latter installations, engineers must be constantly alert to conditions which permit leakage. The pressurized body presents a more aggravating problem because the entire structure is involved.

Detail design to prevent leakage is complicated by the large number of parts which must be coordinated between the different designers so that leakage conditions do not arise. Designed-in leaks are sometimes very difficult to locate and the leakage channel may be several feet long, with corrections being obscure.

Simplicity, rigidity, and accessibility are the main requirements for effective sealing. Within practical limits, any structure which is capable of carrying the pressure loads can be sealed, but the cost in money and weight to accomplish this seal varies considerably with the degree of design care.

▶ **Sources of Leaks**—Air leakage is potentially possible in every rivet hole, skin seam, pressure bulkhead-to-skin joints; in every passage of stringers through pressure bulkheads, door, and control cable opening. Intelligent design must be accomplished in these installations to make it practically possible for the structure to act as a pressure vessel, sealed against leakage.

It was once considered necessary that all seams contain sealing tape; that large amounts of putty be used; and that wide faying strips, multiplicity of lines of rivets, and close spacing of rivets were required. All of these items added to the cost and weight of the craft, and in many instances increased cost of maintenance. Testing, development, and simplication reduced these require-

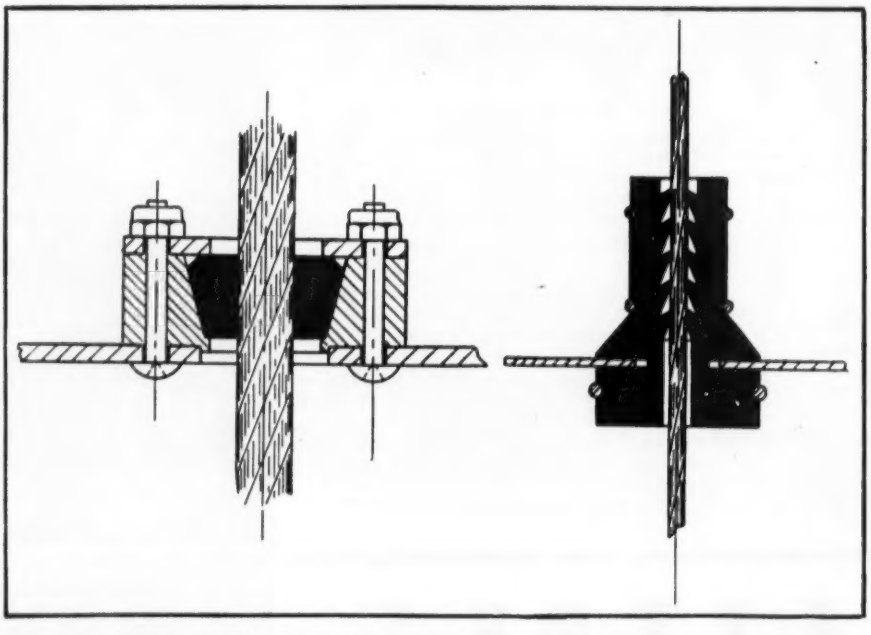
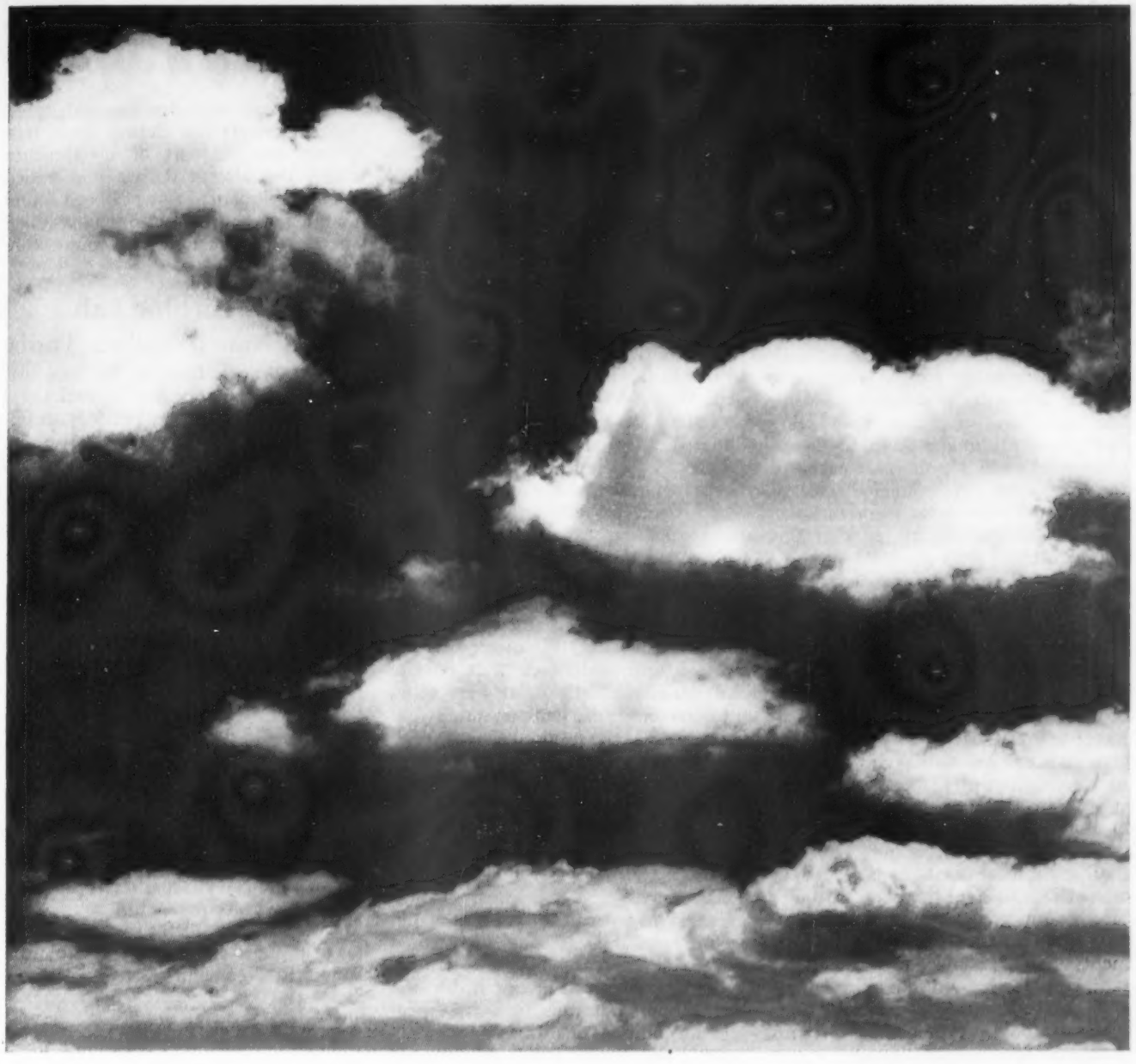


Fig. 3. Cable seal gaskets. First development is seen at left. Newer seal (right) costs less, is simpler to install, and has lower cable friction.



## Sacred Place

Here is the clean, unimprinted sky, blown by gentle winds...
Here no shaft of stone, no marble arch...
no Gettysburg...no Flanders Field...
Yet here was a great field of battle...where gallant men flew and fought, daring death, suffering death...triumphing over death.
Their victories have made secure this sky—ancient altar of man's hope, symbol of his freedom, empire of his future progress.
Americans lift their eyes to the sky today...
and remember with simple thankfulness the courage and sacrifices of the airmen who have made it free.

AN ARMISTICE DAY TRIBUTE TO EVERY MEMBER OF THE ARMED FORCES OF THE UNITED STATES FROM THE MEN AND WOMEN OF **CURTISS-WRIGHT**

ments so that now a large amount of the structure can be assembled without sealing materials and without any more rivets than are normally required.

► **Self-Sealing Rivet**—One development which made this construction possible is the Boeing Seal Ring Rivet (Fig. 1). Countersunk head rivets have always been consistent leakers in flying boat bottoms or pressurized bodies. When used through the outer skin they have usually been sealed by use of an impregnated tape between the fastened parts. Softness of the tape resulted in dimpling or waviness of the seam and extrusion of minute quantities of sealant from seams and around rivet heads, causing aerodynamic roughness. With the Seal Ring unit, force of riveting flattens the protruding ring into all machine marks and minute inaccuracies of the countersunk or dimpled recess—these normally being the cause of leaks. Extensive testing has proved that this rivet effectively seals itself.

In general, most pressurized-section structure is assembled dry in the shop, with sealing materials applied at period of best access. Application is usually via pressure gun which extrudes a bead of controlled size on the pressure side of the seam, forming a fillet there. Filleting material has good plasticity for gun use, high viscosity, good adhesion to bare and painted metallic surfaces, and ability to cure tough and flexible in atmosphere, with retention of these properties at low temperature. Specialized applications require resistance to aromatic fuels—fuel tank areas under pressure must be sealed to prevent vapors from reaching passenger compartments in unpressurized craft.

► **Sealant Testing**—In the selection of seam-sealing materials considerable testing is required, also close liaison with suppliers. Specifications should describe sealant requirements, testing methods, and acceptability limits to permit use of materials from different sources. A standard jig is used in qualification tests to investigate panels representing various sealing conditions. Static air pressures of 12 psi. are applied over a one-hour period at −65, −70, and −125 deg. F. Pulsating pressure tests are also used. Other tests are required to prove anti-corrosion characteristics, low temperature flexibility, high temperature stability, warehouse storage life, water and solvent resistance, and non-crazing qualities (where sealant is used with Plexiglas).

► **Sealant Applications**—Sealants generally used include: (1) Minnesota Mining and Mfg. Co.'s EC750—extruded from a small nozzle on pressure side of seam; (2) Presstite Engineering Co.'s 2H-24E—highly viscous putty for holes, slots, and joggles, and supplied as continuous extrusion approximately ¼ in. in diameter; (3) Pro Seal (Product Research Co.)—soft putty-like material which cures into rubber-like substance with good adhesion, used to vapor-seal tank compartments and other locations subject to solvents or fuel; (4) Firo-Mix—complicated multipart putty which must be mixed shortly before use. Used in high temperature applications (400 deg. F.), and for sealing firewalls against engine fire flames; (5) Duct Supe (Product Research Co.)—for sealing ducts carrying air up to 300 to 350 deg. F. and for use in heated leading edges; and (6) Sponge rubber—for gaskets in window installations; must be compounded of materials which will not craze Plexiglas.

Sealing of doors and hatches is usually done with synthetic rubber gaskets. Design of those on the Boeing 377 and C-97 is shown in Fig. 2. This unique seal is made of strip or sheet material (no special shapes to stock); is mechanically attached (no cement); very easily replaced; mounted on door or hatch so that entire assembly can be removed to better working conditions; not sensitive to manufacturing tolerance; independent of force or distance of depression; and is automatically inflated by cabin pressure. Also, the hatch is installed in fixed dimensional position against locating blocks (no high or low hatches dependent upon gasket section dimensions).

Successful cable seal gaskets are shown in Fig. 3.

During wartime, with widespread subcontracting of large components, it was necessary to test parts at point of manufacture so that leaks could be repaired there. Now, testing of sub-assemblies is done to a very small extent, because test equipment and facilities are expensive for limited quantities of components. First pressure test is usually made after final assembly of the aircraft and since extensive re-sealing is then extremely difficult, it is essential that the structure be practically leak-tight at this stage. This means that shop and inspection organizations require specialized training in construction and testing of pressurized structures, and though this experience is considered of little consequence by some in the industry, a full appreciation would be quickly acquired if an effort were made to build a pressurized aircraft using personnel who had never handled this type of work.

Like other engineering factors, pressure tightness is also subject to tolerances. These are predetermined on the basis of compressor capacity and satisfactory one- and two-engine-out performance, and the leakage is then budgeted to various causes. For the Boeing 377, this would generally be—structural leakage, 153 cfm.; control cables and wire bundles, 10; fuel tank ventilation, 65; and ventilation dumping, relief valve leakage, etc. 59; giving a total of 287 cfm.

Like any new development, pressurized aircraft has caused some misgivings on the part of maintenance crews, but after extensive and varied operating experience, it has been found that maintenance of a properly sealed aircraft structure is a very minor consideration.

## MIT Gas Turbine Lab Offers New Research Tools

Formal dedication of the new gas turbine laboratory of the Massachusetts Institute of Technology provides an important addition to U. S. gas turbine research facilities. The facilities include a supersonic wind tunnel capable of mach number 3, which will be used to study the flow of air into the inlet of supersonic aircraft.

A large air compressor has been installed to supply air to combustion apparatus which will burn up to six pounds of air per second at a pressure of 50 lb. per sq. in. An interferometer is used to measure the density of a moving fluid in the high speed tunnel.

The new building is two stories high and is of heavy reinforced concrete construction. It was financed by grants of more than $500,000 from Alfred P. Sloan, Jr., General Electric, Westinghouse, United Aircraft, General Machinery and the Curtiss-Wright companies. The Navy Department provided many items of equipment.

Professor Edward S. Taylor is director of the new laboratory and Professor Ernest R. Neumann serves as assistant director.

## Amended Price Policy Announced by Reynolds

New system of pricing aluminum extruded shapes has been announced by the Reynolds Metals Company. This system is said to prompt price reductions on heavier extrusions weighing .250 lb./ft. and up, amounting to as much as 4 or 5 cents a pound or a percentage decrease of approximately 8 to 10 percent.

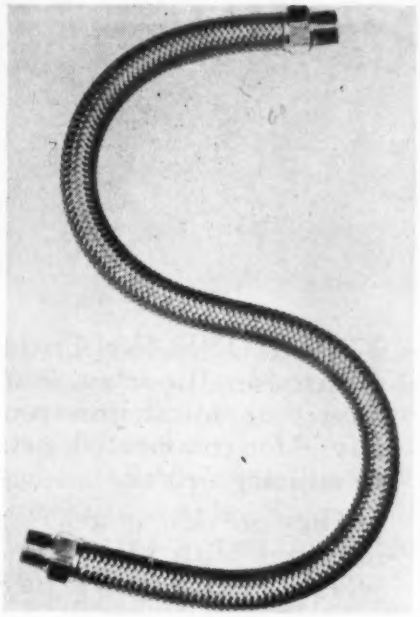
Coupled with this pricing plan was the statement that die charges for solid-shape extrusion dies and for rod and bar extrusion dies would be absorbed by Reynolds after certain minimum shipments of metal are made from such dies.

R. S. Reynolds, president of the Metals Company stated that this step should aid tremendously in bringing aluminum extrusions into increased use and should be particularly welcome news in the face of rising costs of other metals.

# NEW AVIATION PRODUCTS

### Flexible Tubing

New Flexible hose for high temperature or high pressure requirements is offered by **Titeflex, Inc.**, 510 Frelinghuysen Ave., Newark, N. J. The hose which is supplied with either flat ribbon or round wire braid has wall thick-



nesses from 0.005 to 0.015 in. Construction of the tubing is such as to resist failures caused by excessive vibration, and it is recommended for extreme service conditions where Monel metal or brass would be affected, such applications include flexible exhaust tubing for automotive power plants, and fuel and oil lines for aircraft.

### Hand Held Tachometer

An electric tachometer developed by the Special Products Div. of the **General Electric Co.**, is said to weigh only 3 lb. and gives accurate and direct readings of linear speeds from 100 to

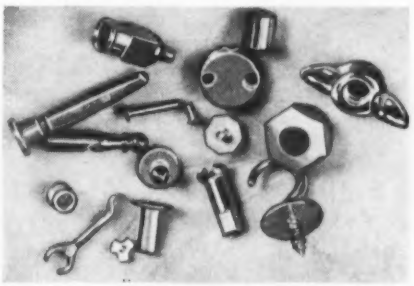
10,000 fpm. and of rotational speeds from 10 to 100,000 rpm. Applications include measuring rotational speeds of motors, generators, turbines, and engines; cutting speed measurements on lathes and milling machines; measuring linear speeds of planer beds, shapers, band saws, and conveyor belts. Consists of two parts—the head which is placed in contact with the moving object, and the indicating unit to which the head is attached by a flexible electric cable. Absence of gear transmission permits change of speed range while spindle is rotating.

### Airport Communications Aid

Designed for the 3,000 medium and small sized airports of the United States is a complete radio transmitter of 12 to 15 watts output for ground to air communication the Model ATR-15 is built by **Audar, Inc.**, of Argus, Indiana, an affiliate of John Meck Industries. The unit is crystal controlled on any specified frequency between 200 and 400 k.c., with a crystal controlled receiver pretuned to 3105 k.c. for receiving private and other aircraft messages. Equipment includes transmitting and receiving antenna wire and insulators, lead in wires, ground wire and ground clamp, and a push-to-talk microphone with 20 ft. of cable. Volume control is located on panel and a trimmer adjustment is provided for antenna peak tuning for added sensitivity. Cabinet size is 17″ x 15″ x 10″.

### Low Cost Die-Casting

Opening up opportunities for development of new products and improvement of current designs, **Gries Reproducer Corp.** makes available to general industry a patented process for the production of really small zinc die castings. This process—covering tiny parts of ½ ounce maximum size, un-



limited minimum size—offers quick service and important economies to manufacturers. GRC is equipped to deliver quantities from 100,000 to millions. With complete facilities for secondary operations, assembly and surface finishing, they are prepared to complete the job from start to finish. Close tolerances are maintained where required.

## Information Tips

#### Composition-Seal Aircraft Bearings

"Aircraft Bearing Catalog A6", issued by **The Fafnir Bearing Co.**, New Britain, Conn., covers company's line of Plya-Seal ball bearings for aviation industry. Contained are cross-sections, dimensional data, load ratings, and other pertinent information for designer. Aircraft control pulley bearings, Type Y helicopter rotor cyclic-pitch control bearings, and double-row units for bellcrank mountings are among various types of composition seal bearings which, company states, afford advantages over metal shield and felt seal units.

#### For Jotting Flight Memoranda

Special "Flight Notes and Expense Record" booklets have been prepared by **Aviation Div. of Standard Oil Co. of California**, 225 Bush St., San Francisco, Cal., for distribution to personal flyers. Ruled space is provided to jot down flight data and various operational memoranda, and in the back of the booklet there are several pages giving flight plan information, CAA cruising altitudes under instrument flight conditions, air traffic control procedures, and radio etiquette notes.

#### Technical Book on Tunnel Testing

Newly published by **John Wiley & Sons, Inc.**, 440 Fourth Ave., New York 16, is "Wind Tunnel Testing," by Alan Pope, associate professor of aeronautical engineering at Daniel Guggenheim School of Aeronautics, Georgia School of Technology. Publisher calls book "the first in this field which completely integrates work embracing design, procedures, and corrections." Topics covered include design and general considerations of tunnels, testing methods with scale models, extrapolation to full scale, and wind tunnel boundary corrections. Price is $5.

#### Aid in Supersonic Calculations

Computation aid for aero engineers working in supersonics is purpose of "Gas Dynamic Tables for Air," new book offered by **Dover Publications**, 1780 Broadway, New York 19. Author is Howard W. Emmons, associate professor of engineering science at Harvard. Main numerical tables concern isentropic gas dynamics functions for air, gas dynamic functions for normal shocks, characteristics, and acoustic velocity. Among chart representations are ratio factors of pressure, velocity, acoustic velocity, area, temperature, and density, and dynamic pressure and mass flux, all versus Mach number. Additional charts treat of aerodynamic quantities upstream and downstream of a normal shock. Price is $1.75.

#### Pickup Unit Senses Instrument Indications

Details on No Torque Instrument Pickup, which automatically senses indication of virtually any type aircraft instrument, are available from **Engine Control Div. of Fairchild Camera & Instrument Corp.**, Jamaica 1, N. Y. Pickup reads position of an instrument pointer, then converts this same position into an electrical phase angle, accuracy being within a few degrees, depending on associated equipment. Installed, pickup replaces the covering glass window on instrument, and a small permanent magnet is then mounted on indicator shaft whose position is to be read. There is no mechanical connection between pickup and instrument, and there are no moving parts in pickup itself.

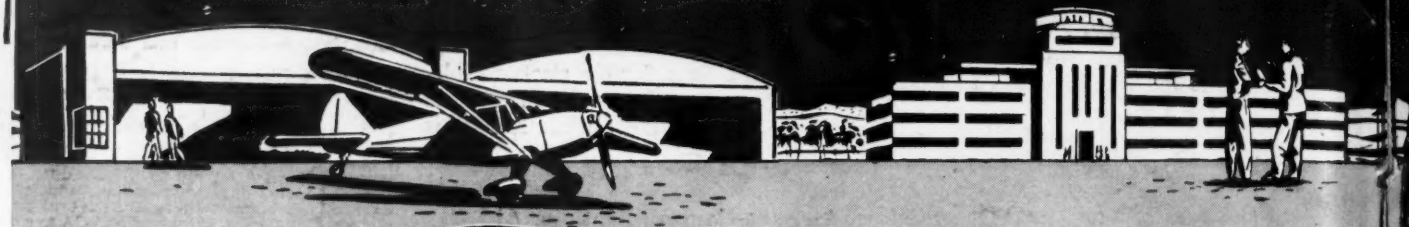
#### Surface Broaching and Arbor Press Units

Single ram, single dual, and duplex surface broaching machines, applicable for precision work in aviation field, are described in special 12-page Circular No. 300 from **American Broach & Machine Co.**, Div. of Sundstrand Machine Tool Co., Ann Arbor, Mich. Featured are photos of actual broaching operations and illustrations of machines and parts, with specifications of various models included. Also being mailed by company is 1-page Circular No. 202 illustrating Type V-1 2-ton press which has been redesigned to provide more work space between ram and work table. This unit is used for arbor press work, assembly work, straightening, and push broaching operations.

#### Plastic-Coated Aviation Fabrics

Booklet describing company's various coated upholstery fabrics is available from **Fabrics Div. of E. I. duPont de Nemours & Co.**, 350 Fifth Ave., New York 1. Materials with applications in aviation field are among those detailed, such as vinyl plastic coated Fabrilite in fire-resistant quality.

# DOWN TO EARTH FACTS



FIRESTONE Sky Champion Tires are the safest, best and most economical tires you can buy — for commercial, personal or military aircraft.

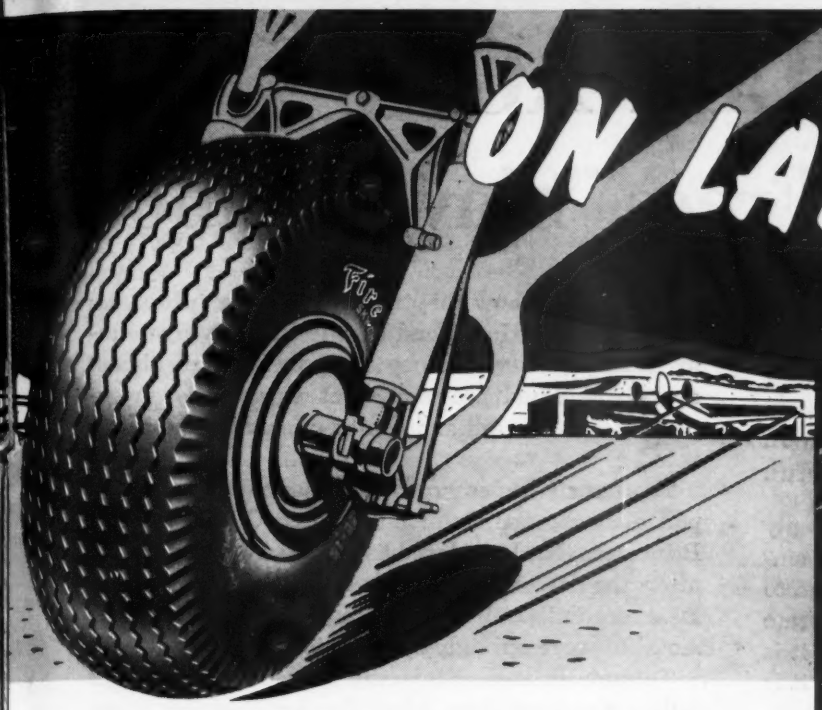
They provide up to 25% more landings with minimum tire weight — give more positive ground control — they minimize blow-out hazards and reduce the number of changes between overhaul periods.

The Gum-Dipped Rayon or

MORE ON

# Firestone

THE BEST, MOST ECONOMICAL TIRES



# ON LANDINGS

Nylon cord bodies are extremely strong. The Safti-Sured construction enables all parts of the tire to flex as one inseparable unit, still further increasing strength and durability.

Whatever you fly, your landings will be safer on Firestone Sky Champion Tires, available at Firestone Aircraft Dealers on more than a thousand air fields throughout the country. Firestone Aircraft Dealers also have the full line of Firestone Accessories, including steerable tail wheel units, propellers, transceivers and transmitters, finishes and dopes, instruments, fabrics, batteries, etc. Make Firestone your aircraft headquarters.

*Listen to the Voice of Firestone every Monday evening over NBC*

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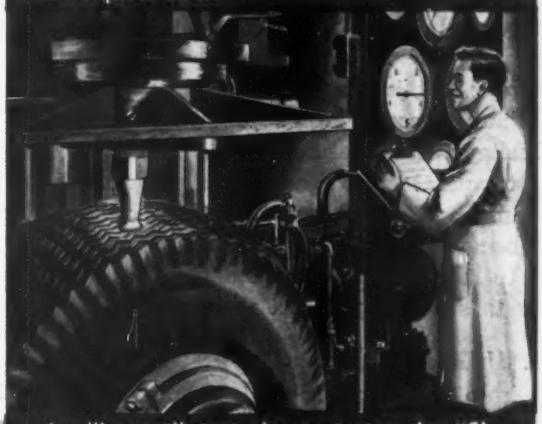
Laboratory "torture" machines simulate the roughest kind of landings to prove the extra strength and durability of Sky Champion Tires.



An "impact" test demonstrates the "Sky Champion's" ability to resist impacts far more severe than those encountered in actual service.

Laboratory tests are augmented by actual landings under various conditions before critical test engineers.

## SAFE LANDINGS

## *Sky Champion* TIRES

## YOU CAN BUY!!

# TAFT-HARTLEY ACT

## Frees "Slave" Labor

**THE TAFT-HARTLEY ACT is two months old. Its full meaning is yet to be determined by decisions of the National Labor Relations Board and the courts. However, on its face, the Act refutes the attacks made upon it by union leaders as hysterical and fanciful.**

Management has had every provocation to reply to these attacks in kind. To the credit of the employers of this country, they have not succumbed to that temptation. They have maintained a temperate attitude toward the new law and the problems it is designed to correct. This approach is right. But it is only an approach.

Union leaders will want to settle for nothing short of *repeal.* Their attack on the Act has made some headway. It may be more effective as time goes on. *Certainly the Taft-Hartley law will be repealed if management just sits tight and lets union leaders continue to confuse their followers.*

Management, therefore, must implement its present temperate attitude with a program of positive action. The Taft-Hartley Act must be made to work not because management wants it, but because it is fair to labor—and management can do things right now to see that the Act works. Management can:

**I. Utilize every means at its disposal to acquaint the rank and file of union workers with the truth about the Taft-Hartley Act.**

**II. Suggest amendments to the Act if experience indicates that amendments are necessary.**

**III. Use the law as little as possible in settling labor disputes.**

**IV. Stand firm in its refusal to bargain away the rights accorded by the Act to workers, management, and the public.**

An examination of those four *must's* will show why they provide management with its best program of action.

### I.

**Union members do not know what the Taft-Hartley Act provides.**

There is abundant proof of that statement.

While Congress was still trying to write a law that the President would not veto, FACTORY magazine asked workers how they felt about major proposals in the pending House and Senate bills. Overwhelmingly they felt good. They were in favor of almost every individual provision that was finally incorporated into the bill and passed over the President's veto.

The same story emerged from the national opinion poll made by the Opinion Research Corporation of Princeton, N. J. and published by Look magazine after the law was enacted. It showed that union members uniformly favored major provisions of the Act, but were strongly opposed to the Act itself.

This inconsistency is easily explained. Instead of telling their members what the Act does for them, most union leaders have been condemning it as "a slave labor law" because it curtails the leaders' power and recognizes the rights of the union member and the public.

It is not a slave labor law. All of the basic rights accorded to labor by the Wagner Act of 1935 are preserved by the Taft-Hartley law. All of the unfair labor practices that were forbidden by the Wagner Act are still forbidden by the Taft-Hartley Act.

Nothing in the law impairs labor's right to bargain through representatives of its own choosing.

The Wagner Act condemned as an unfair labor practice any effort by employers to coerce employees in the selection of their bargaining representatives. So does the new law.

The Taft-Hartley Act merely recognizes rights of individual employees, of management, and of the public that were ignored by the Wagner Act.

For example, while the Taft-Hartley Act continues the workers' protection from coercion by employers, it also gives them new protection against coercion by unions. The individual worker is freed from the necessity of joining a union to *get* a job. He may still be required to join a union to *keep* his job, but not unless a majority of the workers vote for such a requirement in a government-supervised election.

Some people think the Taft-Hartley Act is weak in protecting the rights of the individual worker. They think that membership in a union should never be made a condition for holding a job. This is true. However, the Act does restore to the individual worker some rights which were blotted out under the Wagner Act, just as it does to management and the public.

A fair examination of the new law's provisions will show that they spring from one dominating purpose: i.e., to re-establish equality before the law.

For example, under the Wagner Act union leaders were free to say whatever they pleased about the employer to his employees. The employer, on the other hand, was denied freedom of speech in talking to his own employees. Now freedom of speech is largely restored.

Under the Wagner Act the employer was compelled to bargain with a certified union. Now the union must bargain, too.

Under the Wagner Act, unions alone had the right to petition for an election to determine whether the petitioning union represented a majority of the workers. Now the employer also has the right to secure an election.

These are features of the new Labor law that management must help workers understand. They must understand why the Act is not the "diabolical monstrosity" Philip Murray tells them it is.

Some companies have already started to explain these things to their workers. Techniques are well established, and they are techniques that any company can use. They include labor law digests in language workers can understand, supervisory conferences to cover points in the Act that affects the supervisor's handling of his job, distribution of reprinted articles that point out how employees benefit from the new law, editorials in plant newspapers and magazines, and advertisements in local newspapers.

## II.

**Management should take the lead whenever amendments to the Taft-Hartley law become necessary.**

For twelve years labor leaders wilfully opposed every attempt to correct obvious abuses in the Wagner Act. We have now proved that a labor law *can* be amended. Let us be sure that management does not resort to the same obstructionist tactics labor has always used.

In carrying out its basic purpose to re-establish equality before the law, the Taft-Hartley Act makes it "unlawful . . . for any corporation whatever or any labor organization to make a contribution or expenditure in connection with" national elections. Corporations have long been so restrained. The novelty is the balancing restraint upon unions, which now have huge financial resources amounting to very many millions of dollars. However, the language of the Act *may* restrain the labor press from saying what it thinks about candidates, thus impinging upon the freedom of the press. Senator Taft has recognized this possibility.

If it should develop that the Act inadvertently throttles freedom of the press—or misfires otherwise—management should take the lead in securing suitable amendments to the Act. By assuming a completely stiff-necked attitude toward any and all changes in the Wagner Act, no matter how badly needed, the dominant labor leaders and their political outriders finally brought on the sweeping revisions provided by the Taft-Hartley Act. Management must not follow that example of stupid leadership.

## III.

**Management will be wise if it uses the new law gently in settling labor disputes.**

So far employers show no disposition to use the law excessively. That is good. An analysis of the NLRB's docket from August 22 to September 30 shows that approximately 90 percent of the cases now before the Board were filed by unions and employees — not by employers.

We have been surveying employers, asking if they will have occasion to use their right to sue their unions. The answer so far is consistently, *"no."* That answer frequently is accompanied by this remark, "We certainly hope not. We have no desire to conduct our labor relations in the courthouse."

The desired result should be for the Act to produce only those law suits that are matters of vital principle. As many employers have remarked, the courthouse remains the worst possible place to conduct labor relations. The best place is in the plant — by free collective bargaining between parties enjoying an equality before the law. The Taft-Hartley law will serve its most constructive role if it encourages this kind of collective bargaining.

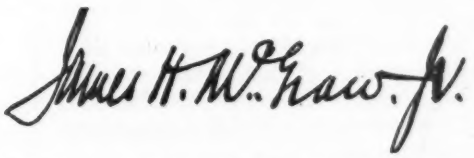
## IV.

**Employers should not bargain away legal rights accorded to them by the Taft-Hartley Act.**

By bargaining away rights given them in that Act, employers serve only to upset a carefully created balance of equality before the law which is an essential element of fair collective bargaining.

Also, by bargaining away rights properly accorded to them, they let down those members of Congress who, in voting for the Act, braved continuous threats of political assassination by powerful union leaders. For their statesmanship in the complicated field covered by the Taft-Hartley Act these Congressmen deserve the support and gratitude of the whole nation—of management, of labor, and of the public alike.

Fairly handled on all sides, the corrective force of the Act can be made a major bulwark of industrial freedom.



*President, McGraw-Hill Publishing Company, Inc.*

THIS IS THE 62ND OF A SERIES

# CAA Airport Red Tape Scored At NASAO Convention

## Veterans Administration discrimination against college flight courses protested at lively state aviation sessions.

By ALEXANDER McSURELY

Failure thus far of the federal airport aid program to meet needs of the small community which wishes a small class I airport was heavily emphasized last week in a state-by-state roundup of reports on new airport construction at the annual convention of the National Association of State Aviation officials, at Ft. Worth.

Prospect for simplification of hampering CAA legal and engineering red tape for small low-cost airport aid projects was held out by Administrator T. P. Wright, but subordinate airport engineering and legal representatives assumed a belligerent attitude in a session following the Administrator's talk offering no major concessions to repeated requests for curtailment of "paper work."

▶ **Small Communities**—Eugene Fryhoff, Missouri; Floyd Evans, Michigan; Asa Rounree, Alabama; and A. W. Meadows, Texas, were among aeronautical directors who reported that their small communities were unable to cope with CAA's complicated requirements, which were described as running up costs on the small projects.

"In Missouri, we are revising our thinking to use only state and local funds on any small airports, because the Federal Airport Act requirements run up the costs," Fryhoff reported. "20,000 is the dividing line. Any project under that is losing money by accepting federal aid. Yet the intent of Congress was to make money available for small airports to promote aviation. It should be done."

Evans informed the convention that Michigan could build 30 additional small airports, if the requirements could be simplified to a one page specification and sketch plan for class 1 fields.

Administrator Wright indicated that he expected the modification to take place through administrative relaxation of requirements which experience would permit.

An NASAO committee is scheduled to meet further with CAA airport engineering and legal officials in an effort to agree on more simplified small airport requirements possibly including projects up to $30,000.

Encroachment of the Veterans' Administration on state administrative agencies for the GI flight training program, and a reported policy of discrimination against college and university flight courses for veterans came in for repeated criticism.

▶ **Expenditure Speeded** – C. Brown, Ohio aeronautics director, reported that VA's ruling on elective flight courses at colleges and universities, in effect was a "speedup" of the expenditure of a veteran's entitlement, if he elected to take a flight course, but that if he chose any other elective offered by the college or university, he was not affected.

Fran Wiley, Montana aeronautics director, Brown and Fryhoff, all cited cases where flight operators in their states had been "persuaded" to change their courses or fees after their payments had been held up and contract renewals had been delayed until the operators agreed to the changes. One case was reported of an operator who changed his course from an Ercoupe course to a course using conventional three-control trainers, at the insistence of the VA representative, who used delayed payments to enforce the change.

Brown declared that VA had infringed on the rights of colleges and universities to prescribe their own elective courses of study by requiring an accelerated charge against the GI student's entitlement if he elected aviation training.

▶ **Vets Denied**—A resolution adopted at the convention, declared that the VA ruling of Sept. 10, effective retroactive

**BELLANCAS AT YOUNGSTOWN**

**This line of Bellanca Cruisairs at Youngstown Municipal Airport contains seven of more than a dozen executive type planes used by Youngstown executives. Among the owners: Youngstown Airway, Inc.; Louis Tripodi, head of Niles Machine & Welding Co.; Packard Electric Division of General Motors; James S. Frey of General American Transportation Corp., and Ralph E. Matthews of Sharon, Pa.**

# When you're glad you have a Snap-on

## Checking Pitch Rotation Tension with a Snap-on TORQOMETER

Here is an unusual, but mighty important use of a Snap-on Torqometer. Mounted on a special adapter, it measures the tension of the blade in the hub.

This is but one of many uses that has established the Snap-on Torqometer as a "must" in aviation maintenance and service. Veteran mechanics agree, that to avoid mechanical distortion resulting from "guesswork" bolt tightening, your best bet is a Snap-on Torqometer because you can see the tension, accurately, as you tighten.

Snap-on Torqometers are available in 15 models . . . from zero to 30 in. lbs., up to 2000 ft. lbs. Ask to see them when your Snap-on man calls or write for new descriptive folder.

**SNAP-ON TOOLS CORPORATION**
8020-K 28th AVENUE • KENOSHA, WISCONSIN
International Division: Kenosha, Wisconsin, U. S. A.

Consolidated Vultee Aircraft Corporation built this giant plane. It has a range of 10,000 miles. Six 28-cylinder Pratt & Whitney Wasp Major pusher type engines provide its total 18,000 h.p., permitting speeds of over 300 m.p.h. All stressed engine parts are of Nickel-chromium-molybdenum steel.

## When the World's Largest Bomber "Sets Down"...

# NICKEL ALLOY STEEL LANDING GEAR PARTS RESIST IMPACTS THAT MAY REACH 1,000,000 FOOT POUNDS

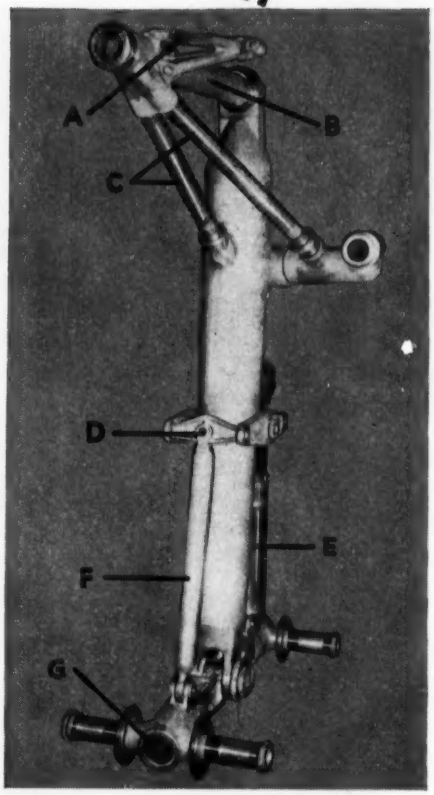
The B-36 weighs 139 tons.

When landing, shock loads on parts that take the impact may soar to 1,000,000 foot pounds.

To meet these terrific stresses, main structural parts of landing gear units are made from Type 4340 Nickel-chromium-molybdenum steel.

Heat treated to a tensile strength of 200,000 pounds per square inch, this Nickel alloyed steel provides remarkable toughness at this high strength level that results in an extra margin of dependability and resistance to occasional overstressing.

An alloy containing Nickel may be the answer to one of your problems. Send us details for our recommendations.




*Cleveland Pneumatic Tool Company, producer of landing gear assemblies for the B-36, use Type 4340 Nickel-chromium-molybdenum steel for the following major parts: A—Jack Lever, B—Pivot Tube, C—Drag Braces, D—Cross Beam, E—Aerol, F—Fixed Link, G—Axle Beam.*

EMBLEM OF INCO SERVICE
TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and performance of engineering alloy steels, stainless steels, cast irons, copper-base and other alloys containing Nickel. This information is yours for the asking. Write for "List A" of available publications.

**THE INTERNATIONAL NICKEL COMPANY, INC.** 67 WALL STREET NEW YORK 5, N. Y.

to Sept. 1, "in effect denies the veteran the right to select aviation training on the same basis as other electives, and sets it aside as a separate course of study with resultant denial to the veteran of the maximum use of his entitlement." The resolution "vigorously protested" the ruling, and asked that it be rescinded.

▶ **Ramspeck Warns**—Robert Ramspeck, executive vice president of Air Transport Association, warned against state legislation which would impose unnecessary, burdensome and duplicating regulations on aviation, or would set up artificial barriers interfering with air commerce. He urged assistance to aviation in zoning to protect approaches to airfields, and voiced opposition to recently proposed gallonage fees on fuel and oil dispensed at airports, and against the restriction of competition created by exclusive fuel or oil contracts at airports.

Jerome Lederer, aviation insurance engineer, appealed for a recheck of flight instructors and refresher courses for them to improve instruction, thereby cutting flying accident rates. He called for more cross-country training in private pilot courses, and use of "simple lingo" instead of the scientific terminology of aviation.

Hugh DeHaven, crash injury research specialist, appealed to the state officials for detailed reports on airplane accidents, to aid in continuing program of study of avoidable injuries. He declared that a small plane can now be built which gives virtual assurance of the occupant's safety in a crash at 40 to 50 miles an hour.

James Batchelor, counsel for United Pilots & Mechanics Association, told the association that GI flight training is "only a stopgap." He urged the importance of immediate efforts to increase sales and non-GI flight instruction at airports. Bachelor declared that the medical division of CAA is attempting to obtain further restrictions on pilots, through international ICAO agreements now being developed. He criticized a legal CAA policy of "threatening" pilots with Federal Court suits, and thereby coercing them into making offers in compromise for alleged violations.

▶ **Airmarking Progress**—Blanche Noyes, CAA airmarking chief, described progress of airmarking on the transcontinental Skyway No. 1 for private flyers, and exhibited a map showing other proposed skyways, running north and south along the east and west coasts and down the center of the U. S., and a northern transcontinental Skyway from Boston to Seattle, which are expected to be developed if local and state aid in airmarking along the routes is provided.

## NASAO Officers

Clarence Cornish, aeronautics director of Indiana, was elected president of the National Association of State Aviation Officials at Ft. Worth, succeeding Leslie Schroeder, Minnesota Aeronautics Director. Other officers and regional directors named are: C. E. A. Brown, Ohio Aeronautics Director, first vice president; Frank Wiley, Montana Aeronautics Director, second vice president; William Lazarus, Florida Aeronautics Director, third vice president; Edward Knapp, Vermont Aeronautics Director, secretary-treasurer, and Crocker Snow, Massachusetts; C. A. Moore, Mississippi; Robert Dewey, Illinois; Eldon Stout, Oklahoma; James D. Ramsay, Nebraska; Joseph J. Bergin, Utah, and Chet Moulton, Idaho, regional directors. Boston will be the site of next year's NASAO convention.

In other resolutions, the convention called for:

- Removal of limitations by states on helicopter operations, which restrict the helicopters beyond present civil air regulations.
- A national civilian flight training program following the eventual discontinuance of the GI flight training.
- Reduction of airplane noise to the point where it will no longer be considered a nuisance, through action of airplane manufacturers, on new airplanes.
- An Air Force in being with research and production programs to maintain the force's effectiveness.
- State Airport aid by all states, to assist local sponsors of airports.
- A conference with CAA and CAB leading toward an amendment to the Civil Aeronautics Act which will permit state courts and state aviation agencies to suspend or revoke airman's certificates with cause, after due process of law.
- Streamlined rules, regulations and standards for airport aid.

## O'Brien Appointed

Jerry O'Brien of Erlanger, has been appointed a director of the Kentucky Aeronautics Commission. Mr. O'Brien, a former airlines pilot and a test pilot during the last war, has been serving since last July 1 as technical adviser and public relations officer for the Commission.

# Small Load Service Flying Short Hauls

Coast Air Transport, Inc., Middletown, N. J., has inaugurated a new and highly specialized small load, short haul air service to supplement regularly scheduled air freight routes on the East Coast. Decision to limit service to an area within 600 miles of the eastern seaboard was made to permit better coverage and faster service.

Use of small planes with a high cruising speed and refrigerated cargo compartments for shipping perishables has proved that such precautions decrease spoilage in transit and give such goods a longer useful life after delivery, company officials say. Charges for this service are slightly higher than regular carriers' fees but the difference, it is explained, is made up by added convenience and safety.

▶ **Occasional Shipments**—Catering primarily to firms wishing to move small lots of goods to a metropolitan area for export shipment, or for trans-shipment on a long haul carrier, the new service offers relief to companies who are occasional or one-time shippers. It is planned to meet late or delayed shipments schedules, promote customer good will by delivery of an emergency load, reduce warehousing or inventory costs, avoid surface freight tie ups, prevent production line tie ups or lost man hours, and eliminate pilferage of shipments.

Items flown to date include women's apparel, furs, jewelry, drugs and pharmaceuticals, men's apparel, machine parts, cut flowers, fruits, vegetables, sea food, baby chicks, hardware, and electrical appliances.

▶ **Operating One Plane**—Headed by Joseph D. Scott, former Navy pilot, the company at present is flying only one plane but expects to add others when volume of business warrants their purchase. Maintenance is handled by its own mechanics working on a preventive system developed by Mr. Scott, who reports that the plan has lowered costs for this work to about $85 per month.

The plane now used is a twin engine Beechcraft equipped and licensed for night and blind flying. It is insulated with fiberglas. The company has installed a light weight refrigerating unit which will lower the cargo compartment temperature to about 30 deg. F. even though the outside temperatures exceed 98 deg. Doors and windows are sealed to prevent rise in cargo temperatures while plane is on the ground.

Last summer CAT flew 66,000 lb. of live lobsters from Maine to Atlantic City with a loss of less than 1 percent for the entire operation which was carried out during the hottest weather.

## Big Used Engine Pool Claimed By LA Firm

Possession of more than one-half of the world supply of used series 1830 Pratt & Whitney engines is claimed in Los Angeles by Capitol Aircraft Equipment Co., 1434 S. Los Angeles St., of that city.

Until recently, after a buying campaign of several months in used engine markets topped by a major sealed-bid purchase from War Assets Administration, the company held 3,200 of the engines in warehouses at Los Angeles, Sacramento, and in Florida, Texas, and Oklahoma.

R. L. Burla, former assistant to the president of North American Aviation, partner in the business with S. C. Rudolph, a Los Angeles liquidator, says following early re-sales domestically and to foreign brokers, that his "stockpile" still contains approximately 2,000 1830-92, 600 1830-90C and 300 1830-65 engines in varying condition.

Speculative as the venture might appear, Burla believes the used engine market is due for shortages that will bring easy sales at prices ranging from $200 to $2,000 on the Pratt & Whitney 1830s.

## Student Restrictions Eased By CAB

Liberalization of student pilot restrictions has been announced by the Civil Aeronautics Board in Civil Air Regulations amendment 43-11, which permits student pilots in a certificated flying school to operate an aircraft outside a local flying area designated by an instructor prior to having acquired 10 solo flight hours. Student pilots formerly were required to remain within a local flying area.

A further liberal interpretation of existing regulations has been made by T. P. Wright, Administrator of Civil Aeronautics with regard to the carrying of passengers for hire by private pilots. In a series of new definitions, Wright defined allowable conditions under which a private pilot may use an aircraft as follows: (1) cross country trip carrying passengers who would share the expense; (2) test flying aircraft following repair and ferrying aircraft from point to point; (3) as a traveling salesman the private pilot may use aircraft for his personal transportation provided the aircraft is not used to deliver merchandise sold by salesman, and (4) a private pilot employed by a company for other than piloting of aircraft may carry passengers or other employees on business trips provided the trip is for his own personal transportation and other passengers are incidental to the trip.

## BRIEFING FOR DEALERS AND DISTRIBUTORS

**METROPOLITAN SALES OUTLOOK**—Distributors in the New York area, one of the largest plane markets in the country, report a discouraging summer season's sales record. Feeling expressed by one of the largest distributors of light aircraft is that the poor showing of sales could be traced directly to the state of production throughout the country, figuring that high prices of necessities has discouraged many would-be purchasers from investments in what are believed to be luxuries. Another large dealer takes the stand that the slump was due in part at least to the poor flying weather which has plagued the area over a portion of the season. His theory is that when poor flying weather prevails, the public quickly loses interest in aviation. Consensus is that business is so bad now that any change is bound to be an improvement.

**GEMINI IN STORAGE—Much heralded sales tour of the Miles Gemini twin-engine personal plane was cut short at Chicago recently when the Miles representative was suddenly called back to England. The plane is at present in dead storage at the Camden, N. J., airport. In the future, imports of Miles' planes will be handled by the firm of Smith Kirkpatrick, New York. They plan no further use of the English version, stating that they prefer to wait until a plane equipped with Continental engines is available for demonstration to prospective buyers.**

**PLANE COMPETITION**—With the recent demonstrations of the Luscombe Silvair Sedan in New York and advance publicity on the Cessna 170 came speculation as to the chances that these newcomers might become a major factor in the future sales of the four-place Stinson. Whether it will be possible for these two to compete on an equal price basis with the powerful Stinson sales organization remains to be seen. It is understood that the biggest obstacles to be overcome will be an inability or disinclination to meet attractive trade-in allowances, and the ability of sales staffs to overcome the years of Stinson leadership in this market. Exact selling price of the Luscombe and Cessna have not been revealed but it is expected that they, too, will be in the $6,000 price bracket.

**COMPARISON ASKED—C. C. Moseley, president of Cal Aero Technical Institute, and Grand Central Airport Co., Glendale, Calif., recently invited the President's Air Policy Commission to have a competent accounting firm make an analysis of costs for pilot training, mechanic training, major overhaul of airplanes, engines, propellers and accessories, when the work is done by the Air Force, and a comparative cost analysis of costs at civilian schools and large civilian operations. Moseley argues that the Air Force should be a striking force not a manufacturing or modification or overhaul force, and that the Air Force should support civilian overhaul companies, mechanic schools and flying schools by contracts, as they are supporting aircraft factories. Air Force maintenance should be restricted to line service maintenance, or what the Air Force calls first echelon maintenance, Moseley believes. The result would not only be a healthier aircraft industry, but an important savings in cost, and efficiency, in the overall operation.**

**SEABEE SHIFT SOON**—Negotiations for the sale by Republic Aviation Corp. of its Seabee are still in progress, with an announcement expected shortly. While Republic is keeping quiet as to prospective purchasers, there are grounds for belief that the production of the Seabee will remain in the East, although a midwest organization still is in the running. Republic has nearly cleaned out its backlog of some 50 completed planes, with a sizable portion going into export. The Seabee tooling remains in place in the Republic plant, but must be moved shortly to make way for military work. This lends increased urgency to the negotiations for disposal of the amphibian.

**A & E SCHOOLS—Mechanic schools certificated by CAA graduated 3,113 students from Jan. 1 through June 30, and 10,166 students were in training as of June 30, CAA reports. As of Oct. 1, there were 87 certificated schools, with the greatest number, 23, in Region I. Many of the 87 schools, 43 in fact, give aircraft, engine and combined courses. Twenty-one give the combined A & E course only.**

**AOPA'S AIRPORT RATING**—Aircraft Owners & Pilots Association has completed its second annual check-up of airport conditions and reports that of 1,577 airports surveyed, 627 fields met the "safety-service-courtesy" standards of private flyers. Although that is a marked improvement over the condition last year when but 443 airports rated "above average," it is a good deal less than 50 percent of the fields visited, and these fields constitute in turn less than 50 percent of the airports permitting private flying. In addition to the 627 "above average" fields, 60 others qualified for the new AOPA label of "superior". J. B. Hartranft, Jr., general manager of AOPA, gives credit for the improvement to publicity in magazines and local press regarding the poor conditions.

Dependable

# CHAMPION

AMERICA'S FAVORITE SPARK PLUG

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Actual Size
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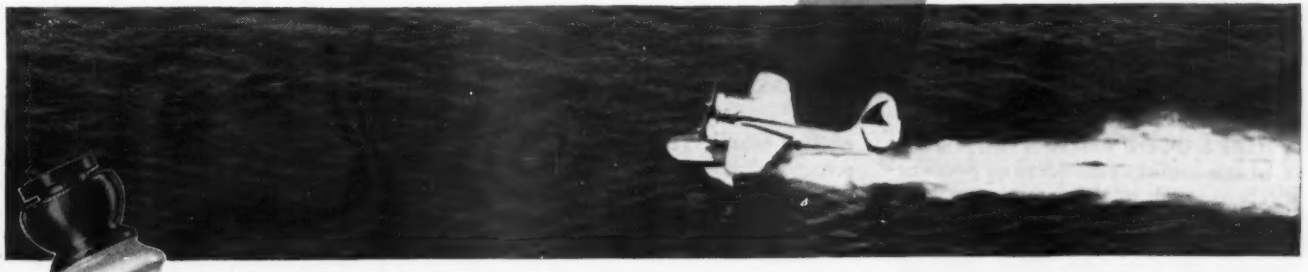
## Amphibian Air Transport's Unusual Service to Catalina

## An Unusual Test of Spark Plugs



C26—
Unshielded
Actual Size 2⅛"

Twelve round trips daily from Long Beach to Avalon Bay, Catalina Island and six round trips from Burbank to Avalon, with extra sections on Sundays and Holidays, is the unusual operation of Amphibian Air Transport Incorporated.

Here is a real test of spark plugs and one which Champion Ceramic Aircraft Spark Plugs meet with outstanding success. Mr. C. E. Hunsinger, Vice-President, writes: "We have used Champion Spark Plugs exclusively since commencing our operation—we find Champions —the only plug that will stand the constant starting and stopping of engines, necessitated by our type of operation." Champion Spark Plug Company, Toledo, 1, Ohio.

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## . . . are flying with this 5-mile-a-minute airliner!

**THERE'S GOOD REASON** why many of the country's builders of postwar aircraft—such as this brand-new five-mile-a-minute Martin 3-0-3—turn to Pittsburgh for finishes that are exceptionally durable and good looking.

In its Aerohide Aviation Finishes, Pittsburgh offers a complete line especially developed for all aircraft surfaces. These coatings are the result of a *leadership* in paintmaking which derives from intensive research, wide experience and a system of *quality control* unmatched in the industry.

**Aerohide Finishes** provide utmost protection against corrosion of metal parts, warping and weathering of wood and deterioration or loss of tautness of fabric. They help to maintain structural safety.

**Likewise,** their bright, lasting colors add to visibility at the same time that they enhance distinctive design.

**Call on us** for advisory service. Our broad experience in the making of all kinds of industrial finishes often can save you time and money. We'll be glad to send you on request our new booklet containing large color chips and complete description of Pittsburgh Aerohide Finishes and their uses.

PITTSBURGH PLATE GLASS COMPANY Industrial Paint Division, Pittsburgh 22, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Houston, Texas; Los Angeles, California; Portland, Oregon. Ditzler Color Division, Detroit, Michigan. The Thresher Paint & Varnish Company, Dayton, Ohio.

**Pittsburgh Aerohide Aviation Finishes**

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**PITTSBURGH** *Industrial* **FINISHES**

**PITTSBURGH STANDS FOR QUALITY PAINT AND GLASS**

## 1947 IATA Sessions Concluded in Brazil

**RIO DE JANEIRO**—The third annual general meeting of the International Air Transport Association has concluded at Quitandinha after disposing of several measures of prime importance to world airlines.

Approving a budget of $645,000 for 1948—slightly higher than 1947 to provide money for joint tariff studies and a European liaison office for technical matters—the congress voted a new method of assessment of IATA dues.

Revenue ton-kilometers performed in each member's international operations are the basis for the new formula, which limits assessments to a $2,500 minimum for associate members and $56,500 maximum for active. Previous basis was the all up weight of each fleet in international operations.

Six new admissions to membership were approved: British Commonwealth Pacific Airlines, Central African Airways, Compagnio Belge de Transports Aeriens (Cobeta), Empress Transportes Aerovias Brasil, Aerlinte Eireaan, as active members, and Lloyd Aereo Boliviano as associate member. Total membership now is 69. The meeting tabled a proposal to admit charter carriers to a special membership category, leaving IATA restricted to scheduled airlines.

In addition, the general meeting:

- Set up arbitration procedures for settling disputes without recourse to law, through three-member panels of which a majority decision is binding on both parties to individual disputes,
- Voted measures to enforce decisions of commissions looking into alleged breaches of IATA traffic conference obligations,
- Urged that governments ratify a new international convention to define ownership rights in aircraft used internationally,
- Established jurisdiction of the traffic conference over commissions for travel agents, and
- Abolished a $500 fee for members to encourage smaller airlines to use services of the IATA clearing house.

Brussels was selected as site of the 1948 meeting for next summer.

The general assembly followed joint sessions of the Association's three traffic conferences at which it reported "unprecedented agreements on worldwide uniformity of traffic and passenger handling procedures" were reached.

***Tokyo Letter:***

## Air Travel Booming in Pacific

**TOKYO**—Trans-Pacific air passenger business is really booming, judging from the remarks of Pan American World Airways and Northwest Airlines officials. Pan Am's Pacific division is said to be making money for the first time. Financially this section had always been a grim failure.

If the present pace is maintained, Northwest expects to see its Northwest Passage route and Orient service paying in on the black side of the ledger by early '48. Reopening of Japan to private foreign trade has provided a lot of revenue passengers. Another factor helping build passenger lists has been the generally poor accommodations provided by steamship lines so far.

Floating dormitories like the SS General Meigs, the SS General Gordon and the Marine class steamships are just a means of getting from the Pacific Coast to Shanghai and other points. The extra cost of a plane ticket buys a lot more comfort.

In Hawaii, Pan American may have struck a gold mine. Many Hawaiian Japanese are anxious to have a look at the old country. At latest count there were 3,000 applications for tickets. Of course ban on travel to Japan except by permission of the Supreme Commander for the Allied Powers, the Joint Chiefs of Staff and the Department of State has prevented all of this travel.

* * *

Flying an airline through the territory of an occupation Army provides a lot of headaches. Neither line has complained very much, because they feel that the Army and SCAP in particular have tried their best to help.

Northwest, however, has been plagued by one inconvenience: The intransit visa which every passenger must have who passes through Japan. It takes as long to obtain the intransit visa through Washington channels as it does to get clearance to visit Japan. That is a minimum of two weeks.

Silly ending to this tale is that through passengers are in Japan for an hour at most, as yet no SCAP official has ever checked up on the visas. Still Washington insists that these visas be obtained because SCAP wants it that way. SCAP says Washington is to blame.

* * *

Establishment of an intra-Japan civil airline has received a lot of behind the scenes scrutiny in recent months. Right now everything is up in the air. The Far Eastern Commission is supposed to have put the lid down.

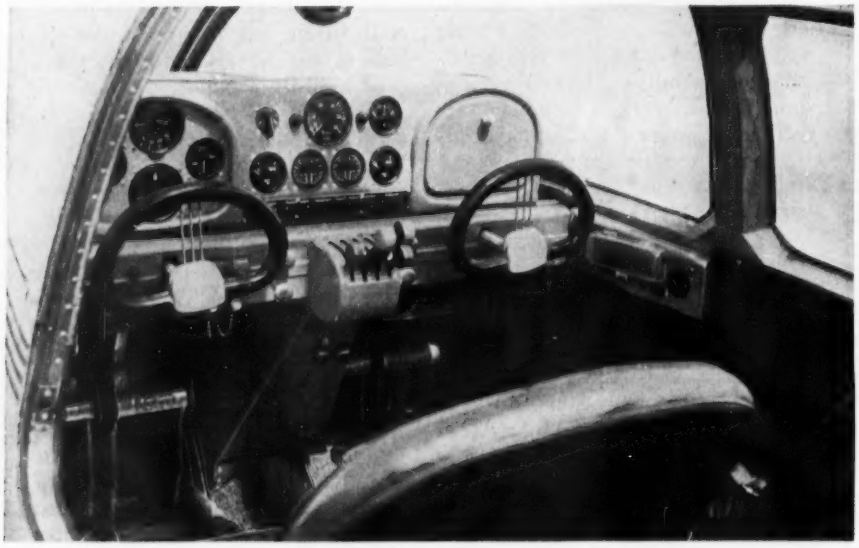
The point is that a Japanese civil airline could maintain the fields. This would eliminate the services performed by U. S. Air Force units. Pan American and Northwest officials were called in to help with the argument.

Beyond agreeing that the time to start an intra-Japan airline is now, Pan Am and Northwest are in general disagreement. Pan Am would like to take over the entire supervision of the operation alone. Northwest doesn't want to do the job single-handed; it does want a finger in the pie.

With the ban on Japanese participation in aviation activities, a foreign airline or group of airlines would have to take on the job of setting up and operating the service. One strong point which Northwest is beating the drum about is that its main Asia base is located at Haneda Airport, Tokyo.

It also has a couple of plush DC-3s sitting on the airport. These make the shuttle hops to Seoul, Korea, and take out any short charter flights arranged by occupation personnel. This situation has made much face for Northwest around SCAP.

**A. W. Jessup**



## Aero 45

The Aero 45 is the first Czechoslovak all metal aircraft constructed by the Aviation Works, National Corporation, since the war. Its future points to use as freight transport, air taxi, courier service or tourist flights. When fitted with dual control it can be used as a training aircraft and when suitably equipped, can be used for practice in radio-telegraphy or aerial photography.

The spacious cabin of the craft is designed to offer the minimum of frontal drag and is fitted with seats for four or five passengers. Power is supplied by two inverted in-line air-cooled four cylinder WALTER MINOR 4-III engines, each of 105 bhp.

**Dimensions:**

| | |
|---|---|
| Span | 40.35 ft. |
| Length | 24.6 ft. |
| Height | 7.54 ft. |

**Weights:**

| | |
|---|---|
| Empty | 1,808 lb. |
| Useful load | 1,103 lb. |
| Gross weight | 2,911 lb |

**Performance:**

| | |
|---|---|
| Max. speed/sea level | 180 mph. |
| Cruising speed | 155 mph. |
| Landing speed | 47 mph. |
| Absolute ceiling | 17,000 ft. |
| Range/cruising | 595 miles |

Flight tests have proved thorough stability and maneuverability at any speed, even on only one engine.

# WITH AN EYE ON PRODUCTION *Costs*

# AND PRODUCTION *Volume*

AIR, OIL–GREASE COUPLING

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# HANSEN COUPLINGS

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To connect a Hansen coupling, you merely push plug into socket. To disconnect, slide sleeve back with thumb. In both cases, flow is immediately and automatically turned on or off . . . with no time wasted, no losses.

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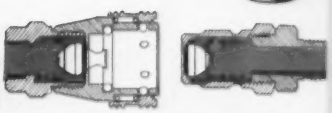
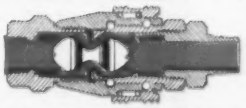
The Hansen Two-Way Shut-Off Coupling.



Red section shows how rubber washer in valve stem contacts valve seat in both plug and socket, sealing both plug and socket against leakage instantly.



Red section shows flow of liquid or gas around spool section of valve, permitting free flow of liquid or gas through coupling instantly upon connection.

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# NOW—Bell Helicopters Battle Locust Hordes

Argentina fights locust plagues with every weapon at its command. But each succeeding season has brought new, bigger clouds of voracious insects—to turn green fields brown, leave herds of sheep and cattle starving. Losses to the corn crop alone totaled more than $25,000,000 last year.

Today, new weapons are being sent into the locust-darkened skies—a task force of 10 Bell Helicopters armed with deadly insecticide. Tersely the Buenos Aires firm, TAYR, reports:

"Helicopters flying directly into locust swarms . . . credited with 98% kill . . . first time locusts effectively stopped in Argentina."

During one helicopter attack, operations had to be quickly shifted "because ground for four square miles so littered with dead locusts uneconomical to continue." Working in teams of two helicopters, each pair applies 10,000-12,000 pounds of anti-locust dust daily.

In other ways, TAYR expects to benefit from the usefulness of The Modern Magic Carpet*. The Bell Helicopters will count cattle, locate strays, dust many crops. For supervisory personnel, they'll shrink the Argentine's vastness.

Overseas and at home, Bell Helicopters make the difficult easy. They're on the job in all kinds of weather—delivering mail, dusting crops, gathering news and pictures, exploring for oil, surveying, prospecting and saving lives. You name it, the Bell Helicopter does it. For full facts, write Helicopter Division, Bell Aircraft Corp., P. O. Box 1, Buffalo 5, N. Y.

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*T.M. REG. U. S. PAT. OFF. AND PRINCIPAL FOREIGN COUNTRIES ©1947 B.A.C.

## Three Czech Sportsplanes

**HODEK HK101:** This twin engined two place aircraft is adaptable for high sporting performances and suitable for touring and training. Span is 25.2 ft., length, 19.3 ft., height 6.3 ft. Empty weight is 1,102 lb. Useful load is 661-716 lb. Maximum speed at sea level is 219 mph. Cruising speed is 187.5 mph. Stalling and landing speed with flaps is 60.7 mph.

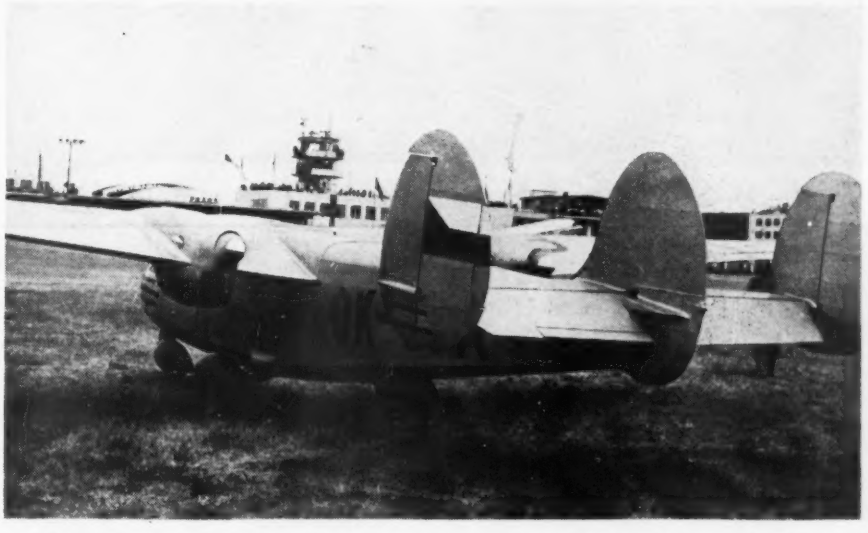
* * *

**PRAGA E211:** Equipped with two pusher WALTER MINOR engines, this four seater high wing monoplane can be used for private air travel or aerotaxi, and is also suitable for feeder air service. Span is 41 ft., length, 27 ft., height 8 ft. Craft lands with flaps down at 50 mph., cruises at 137 mph. Service ceiling is 17,000 ft.

* * *

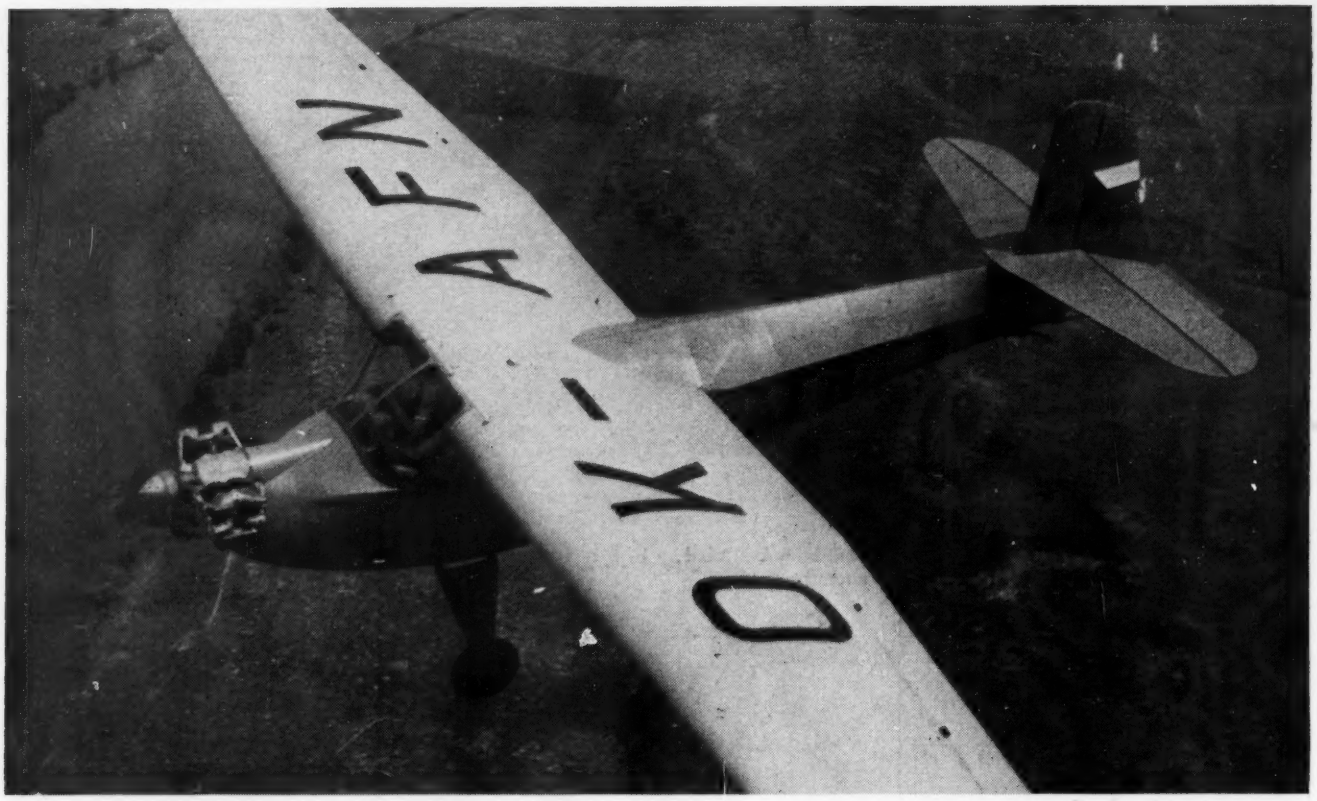
**SOKOL M1C:** A low wing cantilever monoplane with three seats in an enclosed cabin, this craft is fitted with a WALTER MINOR engine of 105 bhp. Fuselage is of wooden frame covered with plywood. Pilot's compartment is separated from engine by a fireproof bulkhead. Span is 32.8 ft., length, 24.1 ft., height, 6.4 ft., Gross weight is 1,707 lb. Crusing speed is 132 mph. Ceiling is 16,400 ft.

**The Hodek HK101, a trim two place sportsplane, is one of a series of new Czechoslovak aircraft.**



**Suitable as an aero taxi or for private plane use the Praga E211 is pictured at a Czechoslovak airdrome.**

**The Sokol M1C in flight. All World News photos.**




Praga Air Baby, powered by either PRAGA D 75 bhp. or WALTER MIKRON 65 bhp., is shown in actual flight.

## Praga Air Baby

**Praga Air Baby** boasts a low fuel consumption, simple construction. Wing is in single piece two spar. Fuselage and rudder units are made of wood with plywood covering. Elevator unit is made of welded steel-tubing covered with fabric.

Lubrication system will vary according to type of engine employed. The WALTER MIKRON engine is fitted with an oil tank with flexible piping, the PRAGA D engine has a built-in tank without any external piping.

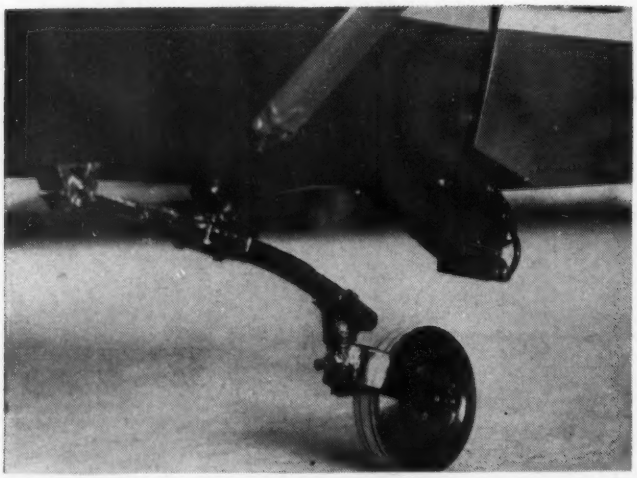
| **Performance:** | **MIKRON** | **PRAGA** |
|---|---|---|
| Max. speed | 116 mph | 116 mph. |
| Cruising speed | 102 mph | 103 mph. |
| Stalling | 40.5 mph | 40.5 mph. |
| Itl. rate of climb | 574 ft./min | 590 ft./min. |
| Ceiling | 13,500 ft | 14,100 ft. |
| Range | 405 mi | 340 mi. |

**Dimensions:**

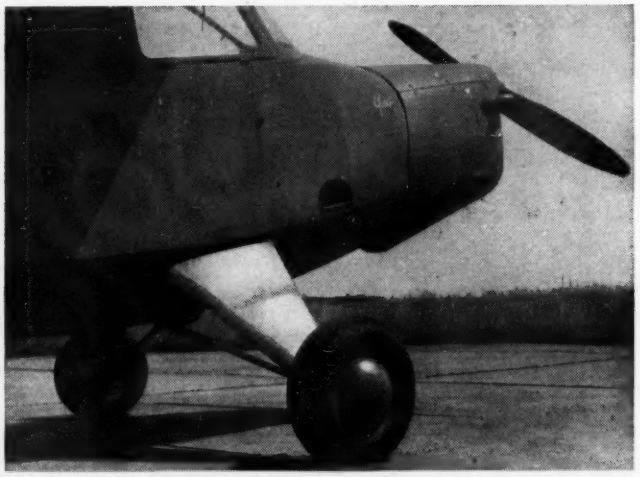
| | |
|---|---|
| Length: | |
| With PRAGA D | 21.65 ft. |
| With W. MIKRON | 23.35 ft. |
| Height | 8.54 ft. |
| Wheel track | 6.25 ft. |
| Wing area | 174.4 sq. ft. |

**Weights:**

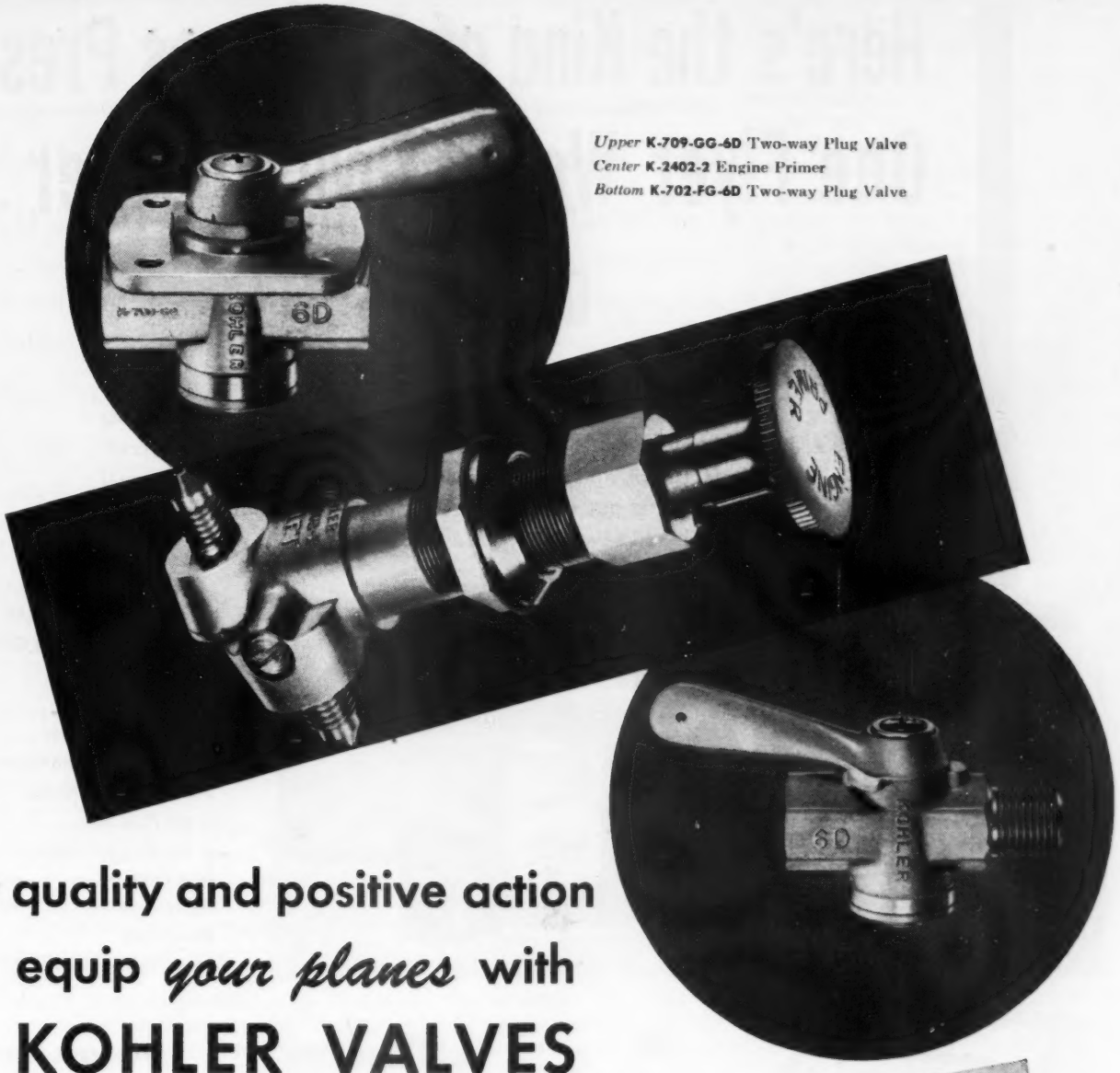
| | |
|---|---|
| Empty | 749 lb. |
| Fuel | 99 lb. |
| Pay load | 180 lb. |
| Gross weight | 1,212 lb. |



Closeup view of tail landing assembly on the Praga Air Baby E114 light two seater high wing sporting and initial training monoplane. Craft is equipped with towing gear for gliders.



Easy access through a folding front screen and roof with safety locks on the fuselage sides is provided in the Air Baby. Seat backs are removable; spacious bags provide accommodations for luggage.




*Upper* **K-709-GG-6D** Two-way Plug Valve
*Center* **K-2402-2** Engine Primer
*Bottom* **K-702-FG-6D** Two-way Plug Valve

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½ gallon Klad Polish
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5 oz. Handy Spot Remover
½ pint Plane Wash
½ pint Wing Walk Black
Paint Brush
Flannel Cloth
Wiping Cloth
Special Combination Price $7.15

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**Whiz Aircraft Cleaning Compact No. 2**

1 quart Cleaner and Wax
1 pint "C" Windshield Cleaner
½ pint Plane Wash
5 oz. Handy Spot Remover
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These special compacts give you the finest in aviation chemicals at prices 20% lower than normal for the individual items! Distributors in every territory are prepared to give prompt service. *R. M. Hollingshead Corporation, Camden, New Jersey; Toronto, Canada.*

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LEADER IN MAINTENANCE CHEMICALS

# Results Vary for Plane Makers With Non-aviation Subsidiaries

**Some manufacturers disposing of diversified enterprises in contrast to earlier trend; others just starting in outside fields.**

Conflicting trends prevail among aircraft builders as to diversification of their activities along non-aviation pursuits. With the curtailment of military orders more than two years ago, many aircraft companies were faced with the problem of utilizing production facilities and the investment of comfortable bank balances.

For a period, there was a definite swing favoring the purchase of industrial enterprises completely unrelated to aviation. For example, the boldest step was taken by Consolidated-Vultee when it acquired control of ACF-Brill Motors Co. Further, the aircraft builder previously entered into an agreement with its parent, the Aviation Corp., now Avco Manufacturing Corp., to produce durable consumer goods such as kitchen stoves and farm implements. As recently indicated, Convair is in the process of divesting itself completely from these non-aviation activities. It now becomes possible to evaluate the success of this program previously followed by Convair. Ultimately, these non-aviation investments grew to more than $19 million out of Convair's current total assets totaling more than $81 million. Thus far, Convair has sustained a substantial loss on its investment in ACF-Brill and its contract manufacturing activities in the nondurable goods industry.

On the other hand, Avco Manufacturing Corp., which was first to leave aviation activities, reported a net profit of $4,622,314 for the nine months ended Aug. 31, 1947. These earnings came largely from operations of its subsidiaries, Crosley Corp. (kitchen utilities), New Ideas, Inc., (farm machinery) and American Central (durable consumer goods).

▶ **Sperry Buys Machine Co.**—Conservative Sperry Corp. recently determined to embark upon a course of diversification by purchasing all capital stock of the new Holland Machine Co. for about $7,600,000. This company produces a hay baler, potato harvester and corn sheller. It is highly possible, however, that through this acquisition Sperry may find an additional outlet for another of its major units, Vickers, Inc., manufacturer of hydraulic products.

The Ryan Aeronautical Corp. evidently has determined also to confine itself to aviation activities exclusively by recently selling its casket design rights to the Boyertown Burial Casket Co.

An otherwise excellent earnings report issued by Northrop Aircraft Inc., was marred by the heavy deficit sustained by its completely owned subsidiary, Salisbury Motors, Inc. For the year ended July 31, 1947, this subsidiary lost $921,671, thus reducing Northrop's net earnings for the period to $240,573.

Beech Aircraft Co. previously was associated with Fuller Houses, Inc., in plans to construct a new type metal and plastic house. However, this affiliation has since been severed by Beech.

▶ **Diversification**—Diversification nevertheless continues in various forms in the aircraft industry. Bell Aircraft Corp. announced a few weeks ago that it was entering into an arrangement to produce 100,000 electric dish washers for the Kitchen Kraft Corp. of Chicago.

Lockheed Aircraft Corp. has maintained its investment in the Pacific Finance Corp., which finances consumer type credits. This investment, totaling $5,039,389, has been returning a profit to Lockheed. While completely unrelated to aviation, this commitment is a very liquid one and can easily be sold by Lockheed, presumably at a profit.

Grumman Aircraft Engineering Corp. about two years ago started the manufacture of a new type aluminum canoe.

▶ **Curtiss Wright Cited**—One of the more interesting studies in diversification centers around the Curtiss Wright Corp. The president of this company recently announced that it has $60 million in excess working capital looking for an outlet. The company's total net working capital balances aggregated $110 million, but of this amount only $50 million was required in the normal aircraft functions. This integrated aircraft builder previously has diversified in other fields; with the actual amount of such investments not disclosed. Moreover, the progress of such controlled subsidiaries is surrounded with considerable vagueness. For example, the 1946 annual report notes that the Marquette Metal Products Co., manufacturer of textile spindles, air compressers, automotive and precision parts, has developed a new diesel engine injector "with apparent success." In the place of actual figures, is this comment: "This operation has proved well worth while to the stockholders of Curtiss Wright Corp. as, regardless of conditions, its earnings during the year have been satisfactory." Similarly, in describing the Victor Animatograph Corp., another subsidiary, the conclusion is advanced: "It is considered a good investment from the point of view of Curtiss Wright stockholders. This trend is continued in respect to the LGS Spring Clutch Corp., another division. Its prospects are summarized as follows: ". . . it is believed that the company, although small, has real possibilities."

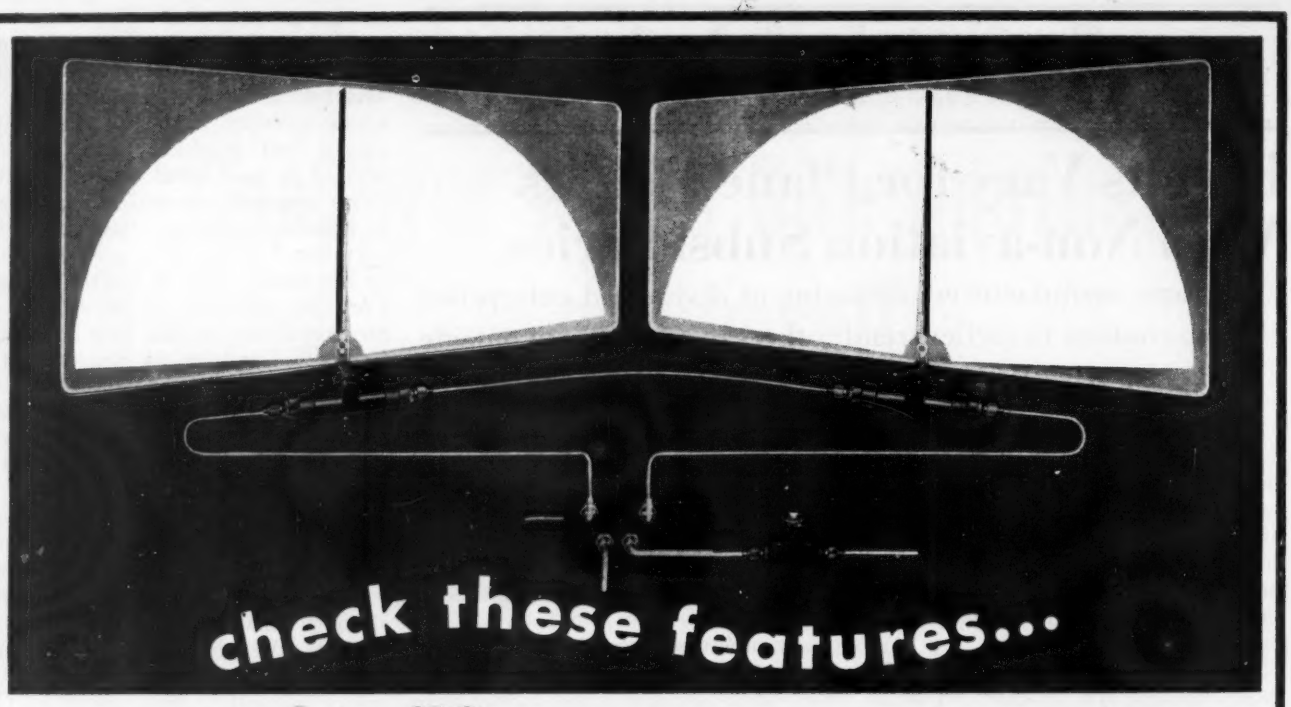
Curtiss Wright has long resisted efforts on the part of its stockholders to reduce its capitalization. However, this retirement of shares is no easy procedure. There are 1,158,702 shares of class A stock which are entitled to $40 per share upon liquidation. At this rate, the equity remaining for the 7,432,039 shares would be reduced to a substantial degree.

▶ **Not Unanimous**—Not all aircraft companies, however, have diversified their manufacturing activities. Boeing, United Aircraft and Douglas are examples of the major builders which have thus far shown no signs of straying from the aircraft field.

The return of capital by aircraft companies no longer in need of excess working capital, has been pressed by stockholder groups. This was one of the implied issues in the proxy battle with the Bell Aircraft management earlier this year. It is a question that has been raised at stockholders' meetings of many other aircraft companies. The tendencies of most managements, not that alone of aircraft companies, is to husband all capital resources. Frequently, the reason attributed to this course is the desire to maintain a "cushion" against adverse periods and thus help perpetuate the encumbent managements in office.

As indicated by the separate case histories, diversification in foreign fields is no assurance that profitable operations will ensue. In fact, on balance, wherever attempted, heavy deficits have been incurred. In the final analysis, most observers believe that a stockholder in an aircraft company generally anticipates that management will remain in that activity, and the quality of its direction will be responsible for its ultimate success.

**Selig Altschul**



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# Douglas Surveys Airline Traffic Trends Between 1947 and 1950

**Plane builder forecasts moderate growth in domestic passenger mileage but impressive gains in cargo volume; recommends airfreight subsidy.**

By CHARLES ADAMS

A modest growth in domestic passenger and mail traffic but a surging expansion in domestic cargo business and in all types of international air transportation is predicted for the next three years by plane builder Donald W. Douglas.

Passenger miles flown by the domestic trunklines will increase from 6,710,000,000 in 1947 to 9,070,000,000 in 1950—a gain of about 35 percent—the Douglas Aircraft Co. president told the President's Air Policy Commission recently. During the same period, he expects overseas and international passenger mileage to jump from 1,660,000,000 to 3,128,000,000—a gain of nearly 90 percent.

▶ **Factors in Expansion**—Continued expansion of domestic passenger travel on the airlines in the next several years hinges primarily on three factors in Douglas' opinion. They are: technological developments promoting greater flying safety and all-weather operations; education of the general public in the advantages of air travel and elimination of the fear of flying; and maintenance or narrowing of the less than 1 cent per mile differential between air and pullman fares.

Douglas' estimate of domestic passenger traffic gains is conservative in comparison with two other well-publicized predictions made during the past year. Last December, the Port of New York Authority predicted domestic revenue passenger miles in 1950 would aggregate 19.8 billion. Alvin P. Adams, aviation consultant, in April of this year, forecast 11 billion revenue passenger miles in 1950.

▶ **Passenger Gains**—According to Douglas' survey, 1947's domestic revenue passenger mileage of 6.71 billion will be about 13 percent better than 1946. In 1948, barring a depression, the study sees an 11 percent gain to 7.48 billion revenue passenger miles, and in 1949 and 1950 further 10 percent gains to 8.25 and 9.07 billion revenue passenger miles, respectively.

Increases in domestic mail ten miles will be at a slightly slower rate than revenue passenger miles, Douglas believes, from 32.96 million ton miles in 1946 he forecasts a gain to 34 million ton miles in 1947, 37.40 million in 1948, 41.10 million in 1949 and 45.20 million in 1950.

▶ **Cargo Outlook**—Biggest domestic traffic upswing will be in the cargo field, according to the Douglas study. From 38.6 million express and freight ton miles flown by the certificated lines in 1946, a jump to 144 million ton miles in 1947 is expected, followed by 208 million ton miles in 1948, 268 million in 1949 and 327 million in 1950. The figures for 1947-1950 include estimates of freight ton miles which the presently uncertificated all-cargo carriers will handle.

The aircraft executive told the Air Policy Commission that one of the best investments in national defense at the present moment might be subsidization of airfreight operations. He said such a subsidy would enable the carriers to drop tariffs to a level where huge volume would be a certainty.

▶ **Subsidy Important**—An operating subsidy—possibly on a plane mile basis—is even more important than government contributions toward offsetting the development costs of newer and more efficient cargo planes, Douglas said. He added that cargoliners are especially

## DOUGLAS AIRCRAFT CO. SURVEY OF AIR TRANSPORTATION GROWTH

Domestic Passenger-Miles and Ton-Miles 1936–1950

| Year | Passenger-Miles (millions) | Express and Freight Ton-Miles (millions) | Mail Ton-Miles (millions) | Total Ton-Miles (millions) |
|---|---|---|---|---|
| 1936 | 388.24 | 1.86 | 5.74 | 46.42 |
| 1937 | 407.30 | 2.16 | 6.70 | 49.59 |
| 1938 | 476.40 | 2.17 | 7.42 | 57.23 |
| 1939 | 677.67 | 2.71 | 8.60 | 79.08 |
| 1940 | 1,041.17 | 3.47 | 10.04 | 117.63 |
| 1941 | 1,369.58 | 5.24 | 12.90 | 155.10 |
| 1942 | 1,398.04 | 11.69 | 21.07 | 172.56 |
| 1943 | 1,606.12 | 15.12 | 35.92 | 211.65 |
| 1944 | 2,229.57 | 17.09 | 50.02 | 290.07 |
| 1945 | 3,362.46 | 22.20 | 65.10 | 423.55 |
| 1946 | 5,947.05 | 38.60 | 32.96 | 654.53 |
| *1947 | 6,710.00 | 144.00 | 34.00 | 849.00 |
| *1948 | 7,480.00 | 208.00 | 37.40 | 993.40 |
| *1949 | 8,250.00 | 268.00 | 41.10 | 1,134.10 |
| *1950 | 9,070.00 | 327.00 | 45.20 | 1,279.20 |

International and Territorial Passenger-Miles and Ton-Miles 1936–1950

| Year | Revenue Passenger-Miles (millions) | Mail Ton-Miles (millions) | Express and Freight Ton-Miles (millions) | Total Ton-Miles (millions) |
|---|---|---|---|---|
| 1936 | 41.5 | .21 | .65 | 5.01 |
| 1937 | 53.6 | .27 | .83 | 6.46 |
| 1938 | 55.3 | .30 | .96 | 6.79 |
| 1939 | 78.2 | .43 | 1.05 | 9.30 |
| 1940 | 111.2 | .66 | 1.26 | 13.04 |
| 1941 | 178.0 | 1.04 | 2.34 | 21.18 |
| 1942 | 264.0 | 2.12 | 8.21 | 36.73 |
| 1943 | 270.6 | 2.56 | 15.75 | 45.37 |
| 1944 | 340.5 | 2.58 | 17.83 | 54.46 |
| 1945 | 448.0 | 4.76 | 8.72 | 58.28 |
| 1946 | 1,100.6 | 8.16 | 15.09 | 133.25 |
| *1947 | 1,660.0 | 12.31 | 26.62 | 204.93 |
| *1948 | 2,171.0 | 16.10 | 38.10 | 271.30 |
| *1949 | 2,640.0 | 19.58 | 51.90 | 335.48 |
| *1950 | 3,128.0 | 23.20 | 63.20 | 399.20 |

Passenger-miles are converted to ton-miles on basis of 200 pounds per passenger (including excess baggage)
* Estimated

adaptable to various military uses.

U. S. carriers engaged in overseas and international air transportation will increase their revenue passenger miles from 1.1 billion in 1946 to 1.66 billion in 1947, 2.17 billion in 1948, 2.64 billion in 1949 and over 3.12 billion in 1950, according to the Douglas study.

▶ **Mail Volume**—Overseas and international mail ton miles will rise from 8.16 million in 1946 to 12.31 million in 1947, 16.10 million in 1948, 19.58 million in 1949 and 23.20 million in 1950, the survey indicated. Express and freight ton miles to and from foreign or overseas points are seen gaining from 15.09 million in 1946 to 26.62 million in 1947, 38.10 million in 1948, 51.90 million in 1949 and 63.20 million in 1950.

During 1947, Douglas estimates an average of 657 planes on the domestic scheduled trunklines will fly about 9.64 billion seat miles and 1.24 billion ton miles. In 1950 he forecasts a fleet of 730 aircraft on domestic trunklines will fly about 15.07 billion seat miles and 1.83 billion ton miles.

▶ **Equipment on 1950**—Planes operated in 1950 on all types of certificated service, both domestic and international, will aggregate about 1,099, according to the Douglas study. The 730 planes on the domestic scheduled trunklines will include 10 Boeing Stratocruisers, an aggregate of 110 Constellations and DC-6s, 100 DC-3s, 80 DC-4s, an aggregate of 180 Convair 240s and Martin 2-0-2s and 3-0-3s, and 250 new DC-3 replacements.

Additionally, certificated all-cargo services in 1950 would have 85 planes—10 C-46s, 50 DC-4s and 25 new four-engine cargo planes. Feederlines are seen with 104 planes—50 DC-3s, 24 other small transports and 30 helicopter transports. U. S. flag international and territorial carriers in 1950 would have 180 planes—40 Stratocruisers, an aggregate of 80 Constellations and DC-6s, 30 DC-4s, and an aggregate of 30 Convair 240s and Martin 2-0-2s and 3-0-3s.

## C. W. France Joins Parks Air Transport

Charles W. France, until recently vice president in charge of maintenance and engineering for Eastern Air Lines, has joined Parks Air Transport, East St. Louis, Ill., as vice president in charge of operations and traffic.

In his new post France will help activate Parks' 2,441 miles of feeder routes in the midwest. The links presently extend from the Twin Cities and Sioux City on the northwest to St. Louis and Indianapolis on the southeast.

Meanwhile, Charles H. Dolson, operations manager of Delta Air Lines, has been elected vice president-operations.

# Railroads Attack Airline Subsidies

The Association of American Railroads, in an appearance before the President's Air Policy Commission, has charged that the taxpayers are subsidizing air transportation to the tune of "much more than $100,000,000 a year."

"If a particular form of transport cannot survive without government subsidies there is obviously something wrong with its management or endeavors," the Association declared. "The air industry is more than 20 years old. It has attained the stature of a giant. Its days of being pampered and coddled should be terminated."

Annual subsidies for the airlines were listed by the railroad group at follows: mail payments, $10,863,000; airports, $56,187,500; airways and aids to navigation, $53,000,000; weather observing and forecasting, $8,630,000; safety regulations and practices, $10,000,000; government air promotional activities (CAA general administration), $4,824,000; technical research and development (CAA), $1,600,000; National Advisory Committee for Aeronautics, $29,673,000.

## PAA Plea Denied

CAB has refused Pan American Airways' request for rehearing and reconsideration of last May's decision which extended Western Air Lines' AM 63 from San Francisco to Seattle and Portland.

## EAL Reports Deficit During Third Quarter

Reporting a net loss of $908,308 during the third quarter of 1947, Eastern Air Lines early this month announced that its board of directors had omitted declaration of the semi-annual dividend of 25 cents a share normally paid in December.

The third quarter deficit compared with a net profit of $1,062,607 in the same period last year. E. V. Rickenbacker, president, said the board felt it wise to pass the dividend rather than take it out of borrowed funds.

He attributed the third quarter loss to several factors, including the cost of integrating a fleet of 14 new-type Constellations, the return of normal travel habits in the summer of 1947 resulting in a seasonal drop of EAL traffic, and the abnormal disruption of schedules in the south during September as a result of poor weather conditions.

To date FAL has borrowed only $5,000,000 of the $20,000,000 made available to it late last year on a five-year revolving credit basis, and Rickenbacker emphasized that every effort is being made to limit the debt to this amount. The entire fleet of new-type Constellations costing about $16,000,000 has been completely paid for and delivered.

## Colonial Files Suit Against Resort Airlines

Colonial Airlines has filed suit in New York State Supreme Court for damages from Resort Airlines, Pinehurst, N. C., and is seeking an injunction to prevent the uncertificated carrier from using the descriptive terms "Skycruises" or "Skycruisers" in any of its advertisements.

The suit asked that Resort be required to account and pay over to Colonial all profits realized from use of the two terms. Colonial said it had used the expressions "Skycruises" and "Skycruisers" to identify its services as far back as 1940—many years prior to their usage by Resort for its all-expense tours.

## Investigation Underway On PAA Alaskan Crash

Possibility that charts with incorrect figures on mountain elevations caused the crash of a Pan American Airways DC-4 into an Annette Island, Alaska, peak last month is being investigated by company and government officials.

The accident, in which 13 passengers and five crew members were killed, was the first crash of a four-engine commercial plane in Alaska. Residents of the area said Mount Tamgas, the site of the mishap, is around 4,000 feet high instead of the charted elevation of 3,610 feet. The PAA plane hit the peak about 200 feet below the summit.

### Jobs Stable

Employment in aircraft industries during the mid months showed little change from last year, according to the Bureau of Labor Statistics.

Aircraft and parts plants: the 130,700 employed in August and the 129,300 engaged in July, compared with employment of 134,200 in August and 128,600 in July of 1946.

Aircraft engine plants: the 26,700 employed in August and 26,800 employed in July, compared with 27,500 in August and 26,500 in July of last year.

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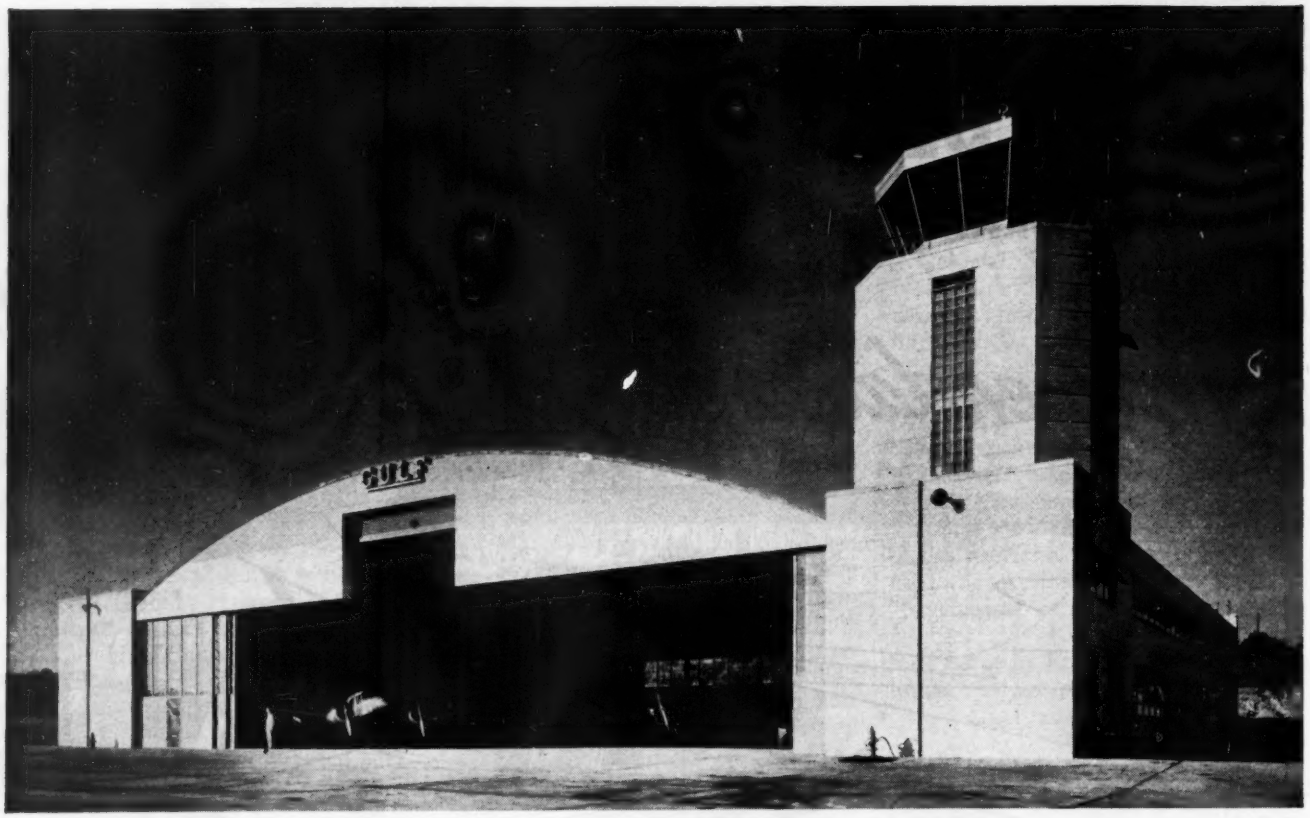
**DELCO-REMY—WHEREVER WHEELS TURN OR PROPELLERS SPIN**



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**LURIA STANDARD HANGARS** are available in both curved and gable type roofs with clear door openings from 60 feet to 200 feet. The contour clearances are designed to accommodate all standard makes of planes. By allowing complete freedom of choice in length and in size and type of lean-to's, these Standard Units can be adapted to meet any combination of shop, storage and office requirements. All sizes of Luria Standard Hangars are designed in two weights—one to meet the load requirements of northern climates, and the other to effect the utmost economy for southern climates. Supplementing the Standard line, Luria is also prepared to design and furnish Hangars to meet any special requirements.

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**1st NATIONAL BANK BLDG.**
**CHICAGO 3, ILLINOIS**

**1734 CANDLER BUILDING**
**ATLANTA 3, GEORGIA**

# U. S. Carriers Retain Bulk Of Trans-Atlantic Traffic

**Three American companies handle 75.4 percent of passengers traveling from or to New York in first half of 1947, CAB survey shows.**

U. S. carriers, which practically monopolized trans-Atlantic air traffic during most of 1946, hung on to the lion's share of business in the first half of 1947 despite increasing foreign competition.

A CAB survey shows that traffic funneling into and out of New York City soared from 37,845 in the first half of 1946 to 67,135 in the second half of 1946 and 80,108 during the first six months of this year. The share of total business handled by U. S. carriers dropped sharply from 94.78 percent in the first half of 1946 to 76.87 percent in the final half of 1946 as foreign lines began operations.

► **Proportion This Year**—But during the first half of 1947 American flag carriers captured between 74 and 76 percent of all traffic each month, averaging 75.40 percent. Foreign companies took their largest share of traffic (about 30 percent) during October and November of 1946, when TWA pilots were on strike.

Of the 80,108 trans-Atlantic passengers bound in or out of New York during the first half of this year, 33,869, or 42.3 percent, were U. S. citizens. Citizens of other countries numbered 46,239, or 57.7 percent.

► **Division by Citizenship**—While American flag carriers flew 75.40 percent of all trans-Atlantic passengers to or from New York in the first half of this year, their share of U. S. citizens making the crossing by air was 83 percent and 69.8 percent was the figure representing their share of foreign citizens.

The CAB study indicates a possibility that U. S. citizens traveling to and from Europe may be showing increased preference for foreign airlines. In January of this year, 87.54 percent of the Americans making the ocean crossing went via U. S. lines. By April the percentage had dropped to 84.68 percent and by June had gone even lower to 79.96 percent.

► **Dollar Shortage**—Meanwhile, the proportion of aliens traveling via American flag carriers held steady at about 69 percent. An increasingly severe dollar shortage abroad may force a larger percentage of foreigners to use their own flag lines whenever the space is available.

During the first half of 1947, the three U. S. flag lines on the North Atlantic run made 2,540 trips in both directions, carried 60,398 passengers and had an average of 23.8 passengers per flight. Foreign carriers in the same period made 821 trans-Atlantic trips, carrying 19,710 passengers and having an average of 24 passengers on each of the trips.

► **Record of Carriers**—American Overseas Airlines made 988 trips with a total of 20,974 passengers, an average of 21.2 per trip. Pan American Airways made 989 trips with 25,202 passengers, an average of 25.5 per trip; and TWA made 563 trips with 14,222 passengers, an average of 25.3 per trip.

Record of foreign flag trans-Atlantic carriers during the first half of this year was: Air France, 150 trips, 4,031 passengers, average of 26.9 passengers per flight; BOAC, 226 trips, 4,851 passengers, 21.5 per flight; KLM, 180 trips, 5,245 passengers, 29.1 per flight; Sabena, 16 flights, 237 passengers, 14.8 per flight; Scandinavian Airlines System, 243 trips, 5,223 passengers, 21.5 per flight; Swissair, 6 trips, 123 passengers, 20.5 per flight.

## WAL Names Thayer System Chief Pilot

Western Air Lines has named Jack L. Thayer as system chief pilot to replace Marshall Wooster, who is on leave of absence. At the same time, Lane W. Smith was appointed regional chief pilot of routes 13 and 63.

The carrier also announced selection of Earl Kimmel as traffic manager and Edward L. Hallgren as superintendent of customer and station service for the inland division.

Other personnel developments:

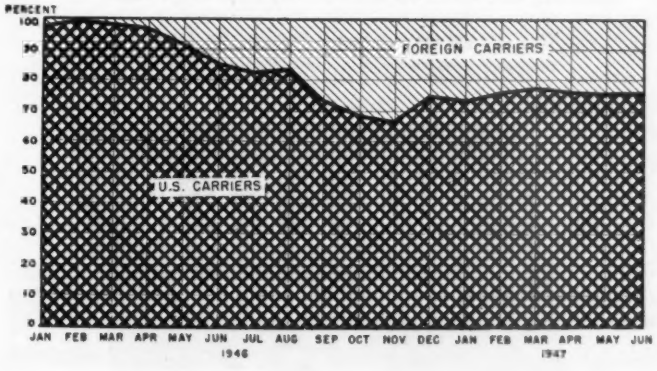
- **Air Cargo, Inc.**—R. W. Williams, formerly with American Airlines, has become eastern regional manager.
- **American**—B. W. Trussell has been appointed director of purchasing to replace Otto H. Hamm, who resigned.
- **Pan American**—Robert M. Evans has been named assistant superintendent of stations for the Latin American division. The Atlantic division has appointed James R. Gilmore as assistant chief pilot in charge of navigation and William H. Lyons as district manager for the Iberian Peninsula and Africa.
- **Slick**—Samuel R. Milbank, partner in Wood, Struthers and Co., New York Investment banking firm, has become a member of the board of directors.
- **TWA**—J. L. Weller and T. K. Taylor have been named assistants to Warren Lee Pierson, chairman of the carrier's board of directors.
- **United**—L. F. Hampel has become director of budgets and research.

## Finland Service Opened

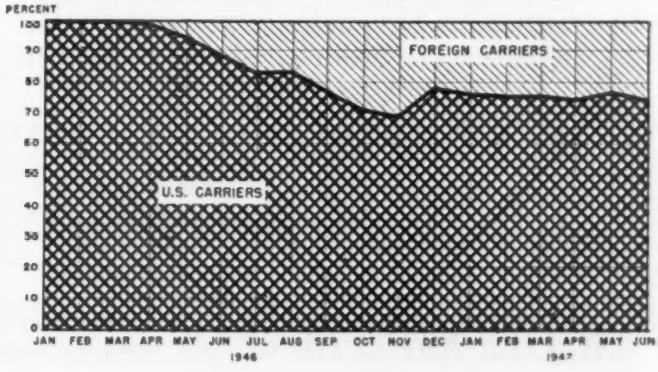
Air service between Helsinki and Stockholm by Scandinavian Airlines System opened recently, marking the first Finnish international service since the end of the war. Daily trips are operated.

DISTRIBUTION OF TRANSATLANTIC PASSENGER TRAFFIC FROM AND TO NEW YORK CITY
VIA UNITED STATES AND FOREIGN SCHEDULED AIR CARRIERS
JANUARY 1946 – JUNE 1947

A. CARRIER DISTRIBUTION OF TOTAL MONTHLY TRIPS MADE




B. CARRIER DISTRIBUTION OF TOTAL MONTHLY TRAFFIC CARRIED



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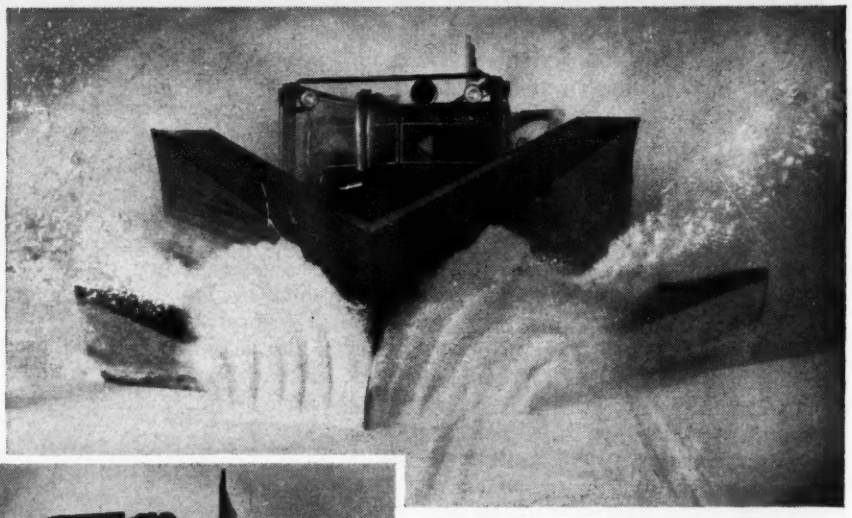
**1** **Use the giant 250 hp. Walter Snow Fighter. It clears a 28 ft. width on its opening run—a 14 ft. width on succeeding runs—at 20-30 miles per hour. The specially designed Front V-Plow throws snow far to the side, eliminating dangerous snow banks. Speed Wings fan out the snow to give remarkable dispersion.**



**2** **Use two 185 hp. Walter Snow Fighters in echelon, as an effective team. Lead machine has a total clearing width of 16 feet. Second machine has widening capacity of 13 feet. A 150 ft. width on a mile long runway is cleared in three round trips, in approximately 15 minutes, for landings and takeoffs. Complete runway is cleared in less than one hour.**

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WALTER SNOW FIGHTERS clear more miles of runway per hour than any other equipment. Their high-speed clearance gets the jump on blizzards and keeps you ahead of the storm. Runways stay open for emergency landings—regular traffic is resumed quickly when visibility clears. Greater safety is obtained because snow is dispersed far off the runway, preventing dangerous snow banks.

The great power and traction of the exclusive Walter 4-Point Positive Drive permits high-speed operation on snow-covered and slippery surfaces, without wheel-spinning, side-slipping or stalling. You have four powerful driving wheels, with positive traction in each, providing tremendous pushing power and speed behind specially designed plows and wing equipment. This combination is far ahead of any other snow clearing method, in speed and thoroughness.

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**WALTER SNOW FIGHTERS**

# TWA to Request Increase in Fare

With American Airlines still determined to hold the price line, TWA last week became the third transcontinental carrier to plan a fare increase.

E. O. Cocke, vice president-traffic, said that in view of rising costs TWA will apply to CAB for approval of a 10 percent boost in domestic passenger tariffs, effective Dec. 12. United Air Lines (AVIATION WEEK, Nov. 3) previously announced its intention to raise fares 10 percent—to about 5½ cents a mile—on Dec. 12. Northwest Airlines' "second round" passenger fare boost went into effect last month.

▶ **American's Stand**—C. R. Smith, chairman of American Airlines' board of directors, said his company would not increase fares at the present time despite the action of other carriers. "We believe the air transportation market can best be broadened by keeping fares within the reach of as many potential passengers as possible" he said. "With the aircraft available today, we believe American can be operated at a profit on the current low fares."

In announcing UAL's fare increase President W. A. Patterson said the construction price of planes had soared 61 percent and wages and salaries have jumped 61.8 percent since the last prewar year. "New construction of ground facilities to handle today's volume of business costs two to three times as much as in the prewar period."

▶ **UAL Record**—Patterson noted that United did $19,363,119 worth of business to earn $598,050 in 1941. Last year the company did $64,948,159 worth of business to earn $1,086,961.

**KLM TERMINAL IN THE HAGUE**

**KLM has opened this 73x33 ft. waiting room in the new air-bus terminal in The Hague, in what the Dutch operator says is the first building especially designed and built as an airline terminal in Europe. KLM soon will put into service a fleet of 16 Crossley coaches to carry air passengers from Schiphol Airport to Rotterdam, The Hague, and Amsterdam.**


*Flyin' high*-and lasting longer because they're Ampco extruded bronze

**Wear-resistant aircraft parts cost less when machined from Ampco extruded stock**

Exceptionally high strength-to-weight ratio is an indispensable asset for aircraft parts. This quality is one of seven outstanding performance advantages of Ampco aluminum bronzes — advantages which give *better* and *longer* service for vital parts subject to wear in any application.

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## Bombay Facilities Pushed To Fill TWA Requirements

BOMBAY—Construction of quarantine facilities at Santa Cruz Airport here is being pushed at top speed in order that TWA's services from the U. S. and Europe can cut out their Karachi stop as soon as possible.

The project has been hanging fire for many months, making it necessary for TWA to halt at Karachi for customs and health exams even though it was supposed to fly directly to Bombay from Dhahran in Saudi Arabia.

The quarantine facilities are only a small step in over-all plans to make Santa Cruz a first-class international airport. But work has yet to get underway on schemes to extend and strengthen runways, construct a new administration building, and improve facilities generally. The end of next year probably will be the soonest any of these items will near completion.

Other recent Indian aviation developments:

• KLM on Oct. 9 made the first Constellation flight into New Delhi's Willingdon Airport. The stop was a special one to pick up a Dutch diplomat bound for Batavia. Heretofore aircraft of this size have always landed at the RAF's Palam Airport, larger field further from the city. The Connie flight also marked India's repeal of a temporary injunction against Dutch aircraft which was instituted as a protest against Dutch policies in Java.

• Indian National Airways, based at New Delhi, revealed heavy increases in all operational categories in a recently issued report covering the year ended June 30th. In the preceding 12 months INA carried 51,949 passengers and 702,718 lb. of freight on scheduled flights, covering 2,127,568 miles in 13,672 flying hours. Increases across the board: passengers, up 171%; freight, 49%; mileage, 54%; flying hours, 48%; total ton miles of traffic, 50%.

• Aviation is playing a small part in the tug-of-war between India and Pakistan over domination of the princely state of Junagadh, between Bombay and Karachi on the Arabian Sea. Pakistan has rushed through a one-a-day service to Junagadh with a DC-3 in an attempt to cement relations and step up communications, for it has no land access to the state.

## KLM to Berlin

KLM Royal Dutch Airlines started Amsterdam-Berlin flights recently with a round trip every Monday. Plans call for inclusion of Hamburg on the Amsterdam-Gothenburg route with an intermediate stop once a week. Thriceweekly service to Frankfurt started last month.

## New Phone Link

Two-way telephone service between Northwest Airlines' domestic planes and any point on the ground may be offered to air travelers next year under a plan proposed by the American Telephone and Telegraph Co.

With the plane's cabin attendant doubling as a "secretary" who places the call, the passenger would be able to go to the telephone station in the aircraft and speak to his office or home over a static-free hookup. Aeronautical Radio, Inc., soon will appear before the Federal Communications Commission on behalf of the airlines to obtain Government approval.

Toll rates, determined by zones, would compare favorably with charges on ground calls covering similar distances. Carl E. Swanson, NWA's manager of general and aircraft engineering, who is in charge of the project, states that the new phone setup would be confined to U. S. flights because the range of very high frequency communications is limited to the horizon. Planes at sea would be out of range of land stations.

**GALLEY MOCKUP**

**United Air Lines employes at Chicago are being used as "guinea pigs" in company tests with a full-scale mockup of the food galley which will be installed in UAL's Boeing Stratocruisers, seven of which are to be delivered starting next spring. Design and service details are being worked out in these mealtime previews during which real food is served from the galley. Engineers record every move with a motion picture camera; stop watch readings are jotted down; and suggestions are made by the employes to improve the service.**

**Robert W. Prescott, left, president of the Flying Tiger Line, is shown demonstrating the new sealed security safeguards used by his company for the protection of air-freight shippers. Sealed security enables the company to call in the FBI if the seal is broken by an unauthorized person. Pilot O. Trapp, center, holds a pouch of seals. Vern C. Miller of the carrier's security division is at right.**

## Flying Tigers Eye Cargo Protection

The Flying Tiger Line has taken the lead in applying railroad protective seal technique to its fleet of cargo planes. Absence of pilfering losses during a try-out month may induce all airfreighters to follow suit.

To Robert W. Prescott, president of the Flying Tiger Line, the sealing of cargo doors with registered metal sealing tapes has shown a two-fold benefit. Under interstate commerce regulations, discovery of a broken seal on a cargo door authorizes the FBI to investigate. In addition, the Flying Tigers' cargo insurance premiums on pilfering policies have been cut 40 percent.

▶ **Reason for Action**—Responsible for the cargo sealing experiment is Vern C. Miller, retired detective lieutenant of the Los Angeles Police Department, who was hired by Prescott last February to set up a security department to halt a mounting toll of in-transit cargo thefts.

Between Jan. 1. and the inauguration of the cargo sealing program, pilfering losses total $35,000. In connection with thefts and attempted thefts, Miller's department sent 49 persons to jail. Since the sealing of cargo doors, not one theft of freight has been reported.

▶ **Captain Responsible**—Success of the cargo sealing is primarily the responsibility of the captain of the plane. He signs for a pouch containing a record book in which he logs the disposition of numbered seals assigned to him. Upon the completion of loading, he padlocks the cargo door and also runs through the staples a metal seal, crimping it securely.

Under company regulations, only the captain may berak the seal en route or at the flight's termination. The captain signs record forms attesting throughout a trip the place, time, and reason for breaking and removing a seal. Both records and broken seals are returned to the company security office for final evidence of company protection of a given shipment.

## AIA President Defends Operations

American International Airways, operators of the Boeing 314 flying boat which was forced down in mid-Atlantic Oct. 14, has formally denied CAB allegations that the company violated the Civil Aeronautics Act.

AIA's letter of registration as a nonscheduled air carrier was suspended by the Board after the accident (Aviation Week, Oct. 27), and the company was ordered to show cause why the letter should not be withdrawn permanently. In its reply, American International said it had never operated as a common carrier but always as a contract service.

▶ **Cites CAA Action**—The company stated it had been informed by CAA that a nonscheduled air carrier operating certificate was not necessary for AIA's type of activity. "If you contend we had no right to operate under contract, why did you not tell us when our flight returned from England on a previous trip?" J. S. Robertson, American International's president, asked CAB.

On its Oct. 14 trip, AIA was under contract to Air Liaison, Ltd., of London, which arranged accommodations for the 62 passengers making the flight. CAB, in a recent court case involving Trans-Pacific Airlines—an uncertificated company in Hawaii—contended that an operator cannot engage in transporting traffic solicited from the general public and avoid the status of a common carrier by contacting the public only through its agents.

▶ **Hearing Set**—Meanwhile, CAB was slated to hold a public hearing in New York late last week to determine the cause of the mid-ocean landing. Depositions already made by crewmen of the flying boat state the craft was completely airworthy.

The pilot said he estimated a 17-hour hop from Foynes, Eire, to Gander, Newfoundland. A 5-hour fuel reserve was aboard. Cruising at about 115 knots, the plane passed over the Coast Guard Cutter Bibb (located 750 miles east of Gander) only 32 minutes behind schedule.

Strong headwinds then cut the plane's ground speed to less than 60 knots. When 255 miles past the Bibb,


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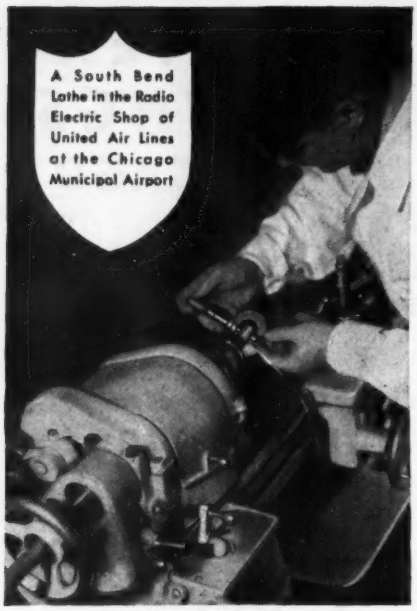


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with headwinds undiminished, the crew estimated it had 4½ hours of fuel remaining, whereas the coast of Newfoundland was 5½ hours away. The decision was made to turn back to the cutter rather than continue on and risk an ocean landing without nearby aid.

## CAB Lifts Suspension On 7 More Nonscheds

Seven more uncertificated airlines among the 42 that lost their letters of registration as nonscheduled carriers last month have received CAB authorization to resume service.

Irregular operators recently reinstated by the board are Meteor Air Transport, Inc., Teterboro, N. J.; Twentieth Century Air Lines, Inc., Charlotte, N. C.; Skyways International Trading and Transport Co., Miami; Coastal Cargo Co., Teterboro, N. J.; Chesapeake Airways, Salisbury, Md.; Transocean Air Lines, Oakland, Cal.; and Caribbean American Lines, Miami. International Air Freight, West Palm Beach, Fla., previously had its suspension lifted after filing necessary tariffs and reports in compliance with section 291.1 of CAB's Economic Regulations.

## Swissair Gets Permit For Atlantic Route

Swissair—Swiss Air Transport Co., Ltd.—has received a foreign air carrier permit from CAB authorizing service between the co-terminals Geneva and Zurich, Switzerland, the intermediate points Shannon, Eire, Santa Maria, the Azores, and Gander, Newfoundland, and the terminal point New York City.

Switzerland's only international air carrier, Swissair expects to operate one DC-4 roundtrip monthly over the North Atlantic route.

# CAB SCHEDULE

**Nov. 10.** Hearing on foreign air carrier permit application of Aerlinte Eireann Teoranta for Ireland-U. S. service. (Docket 3092.)

**Nov. 10.** Oral argument on TWA-Delta equipment interchange agreement. (Docket 2346.)

**Nov. 13.** Oral argument in Pacific Northwest-Hawaii service case. (Docket 2537 et al.)

**Nov. 15.** Hearing on Board's investigation of Consolidated Airfreight Tariff Agreement. (Docket 2719.)

**Nov. 17.** Prehearing conference on additional service in Hawaiian Islands. (Docket 2390 et al.)

**Nov. 25.** Hearing on Taca, S.A., foreign air carrier permit renewal and amendment case. (Docket 3016 and 3017.)

**Dec. 1.** Hearing on PCA's application for unrestricted service from Chicago to Cleveland, Akron, Youngstown and Pittsburgh. (Dockets 1789 and 1790.)

**Dec. 8.** Hearing on Mid-Continents proposed service between Minot, N. D., and Regina, Saskatchewan. (Docket 628.)

# SHORTLINES

▶ **California Eastern**—Will continue as an independent freight carrier, all discussion of a merger with Slick Airways having ended. . . . Company recently added a fifth C-54 to its fleet. . . . Alvin P. Adams, chairman of the board of directors, has taken over active direction of the firm following the resignation of J. J. O'Brien, president . . . . Freight ton miles in the first half of October total 673,697, up 15 percent over the same period in September when the company earned a profit.

▶ **Delta**—Has formally opened its new general offices and shops at Atlanta, Ga., Municipal Airport. The expansion, costing $1,000,000, more than doubled the company's former plant and office facilities at the field.

▶ **Flying Tiger Line**—During the quarter ended Sept. 30 reported $113,090 operating profit. President Robert W. Prescott warned stockholders the earnings should not be taken as a criterion of future operations since business volume has declined considerably due to completion of government contracts.

▶ **Mid-Continent**—Reports $47,966 net profit in September after taxes compared with $43,876 in same month last year. Company's net profit after taxes for first nine months of 1947 was $87,573. Revenue passenger miles in September, 1947, totaled 8,348,651 and load factor was 64.60 percent compared with 7,172,379 revenue passenger miles and 74.93 percent load factor in September, 1946.

▶ **Pan American**—Has signed an interline freight and express agreement with United Air Lines.

▶ **Slick**—Flew 2,151,023 ton miles of freight in the first 27 days of October compared with 2,034,411 in all of September. Load factor in the 27-day period was 91.7 percent against 83.5 percent in September. Company predicts October earnings will be several times the September net of $13,910.

▶ **Trans-Canada**—Expects to have 10 DC-4M pressurized aircraft by year-end. First five planes, built by Canadair, Ltd., Montreal, will go into domestic operation and the remainder on the North Atlantic service. Another 10 DC-4Ms are to be delivered next year. . . . Domestic traffic fell from 49,784 passengers in August to 43,480 in September.

▶ **TWA**—North Atlantic service was cut back to 15 trips weekly (14 passenger and one cargo) effective Nov. 1. . . . Service to Cleveland, Mansfield and Zanesville, O.; Richmond, Ind.; and Prescott, Ariz., was inaugurated early this month.

PACKAGES OF *Safety* AT YOUR FINGER TIP

INTERNATIONAL FLARES

Approved Equipment for Navion

With International Parachute Flares a forced landing can be a safe one. 120,000 candle power is at your command with the bracket of four (one and a half minute) flares, illustrated above. In brackets International Flares are electrically operated. They are also available for operation with International Flare pistols.

Effective at height of 1000 feet, the parachute flare burns brilliantly, giving plenty of time and light for emergency landings.

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Don't fly at night without International Parachute Flares. A complete line of landing flares meeting all C.A.A. requirements.

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- 1-minute; 1½-minute and 3-minute electrically operated parachute flares
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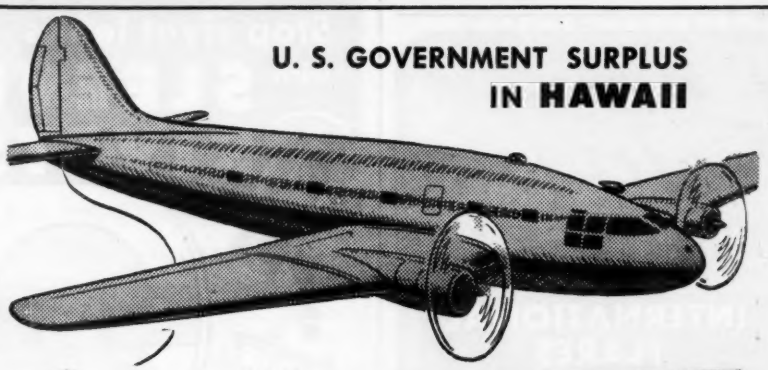

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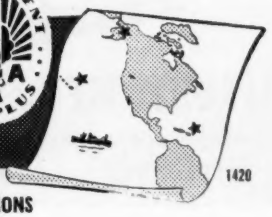

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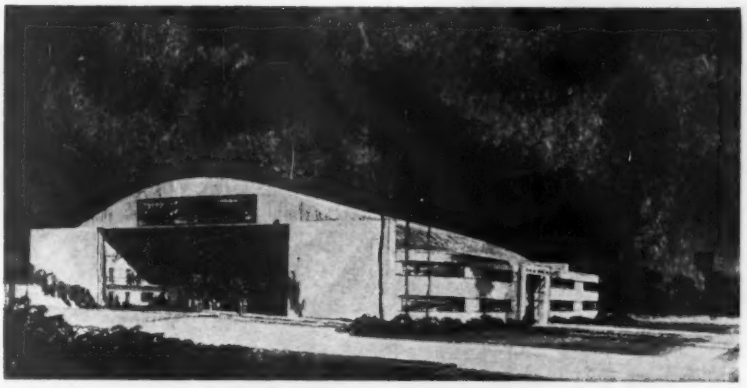

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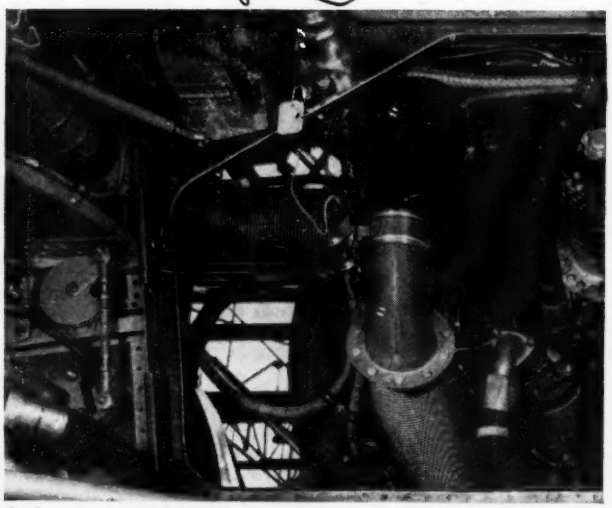

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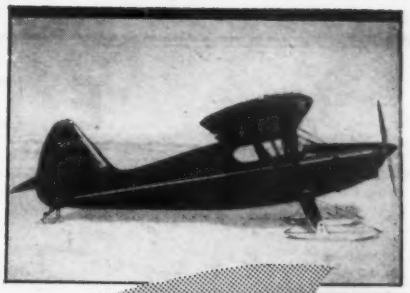

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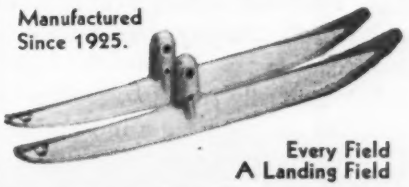

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# EDITORIAL

## Wake Up! Banish Stalls

Aviation takes pride in its youthful reception to new ideas. But if you disclosed to any intelligent observer from another more staid, settled field of transportation that we have a device that might prevent as many as fifty percent of our accidents which we aren't exploiting, he would not believe it.

Growing reluctance of some of us in aviation to accept the inevitability of change for the better is more than disheartening. It smacks of a premature hardening of the arteries that can threaten our economic life in this business. Some of us are acquiring a blindness to facts even when they slap us in the face—or the bank account.

The best example we know is the cold, fishy stare the lightplane manufacturers are giving a remarkably effective and foolproof gadget developed by Dr. Leonard M. Greene and the CAA, known commercially as the Safe Flight Indicator, believed to be the only recognized stall warning device on the market. Some insurance firms already encourage its use.

Administrator Wright's Non Scheduled Flying Advisory Committee at its last meeting adopted unanimously a resolution presented by William Anderson of the Pennsylvania aeronautical group. It urged that a stall warning indicator be made mandatory on all aircraft.

And no wonder. For years close to half of the toll in non-transport operations have resulted from accidents caused by stalls and spins. The latest report of 1947 accidents is running true to form. The first thousand analyzed by CAA caused 90 deaths. Exactly half, or 45 deaths, were due to stall or spin accidents. Several other mishaps of undetermined cause might well have involved these factors. Two other deaths were in accidents of the landing and takeoff category, where stalls and spins are often involved.

Yet, generally speaking, makers of planes which spin and stall are registering unhappiness over the committee's recommendation. It is true, indeed, that the idea should have been theirs first. But pride is hardly a valid argument against saving lives. There is also heard the argument that installation of a stall warning indicator is an acknowledgment by the manufacturer of his product's inferiority. Surely, the manufacturer himself can't even swallow that. There are too many motor cars with non-skid tires, shatter-proof glass, four-wheel brakes and turret top to hoodwink anyone on that one.

Then you will hear a few of those hardy, unreconstructed know-it-all pilots of the old haphazard school say they wouldn't get caught alive with one of these new fangled things because they detect stalls by the seat of their pants or whatever. As far as we know, the seat-of-the-pants era of flying is rather outmoded in these days of GCA, ILS, traffic patterns, etc. Besides, tests have shown that the most experienced pilots sometimes fail even to sniff an approaching stall. Students trained with indicator-equipped planes acquire stall consciousness much earlier than other trainees. But these few men who refuse to down their pride are rather unimportant in the aggregate, and if aircraft are equipped with indicators in the first place they will fall in line.

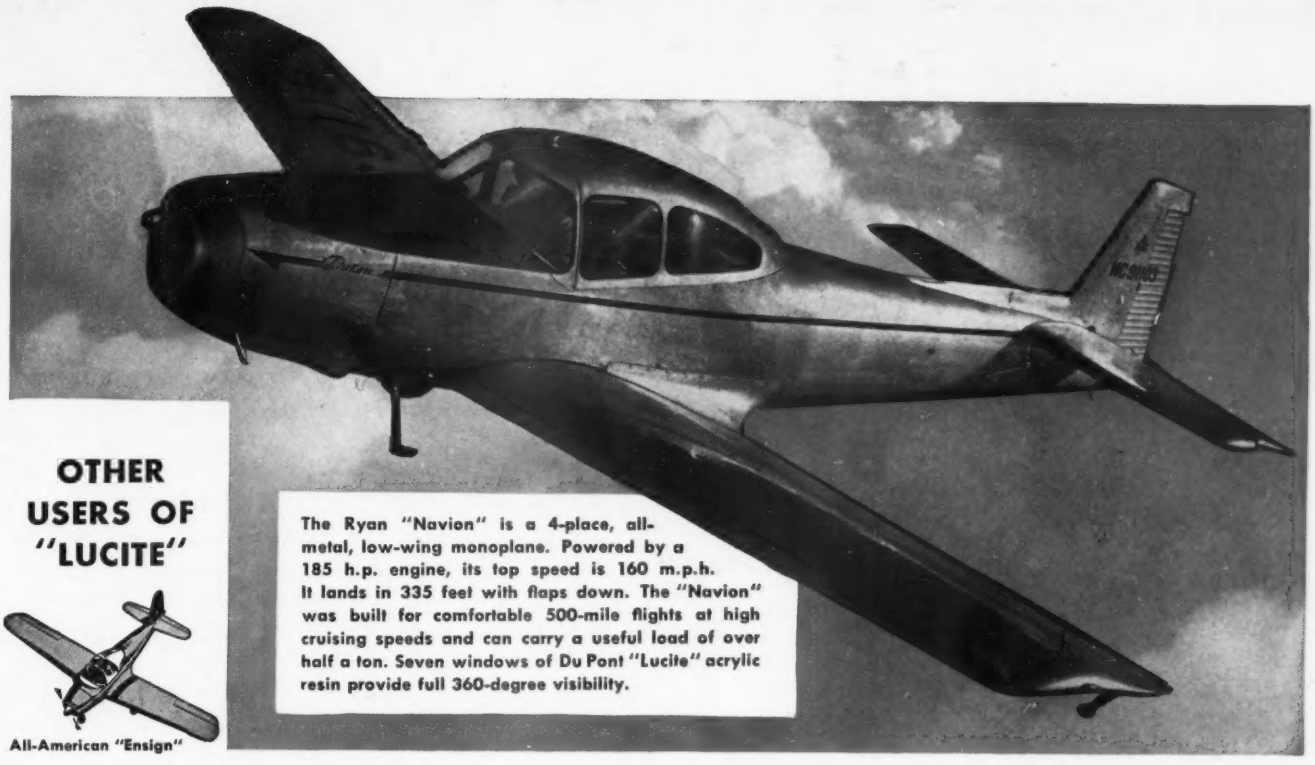
About 1,500 personal aircraft now carry the stall warning indicator. So far, according to Dr. Greene, it has never failed yet. Its weight is eleven ounces, so that it involves no sacrifice of performance. Its cost is trifling.

Consolidated Vultee is installing it on the Convair Liner transport. The Air Force sees tremendous potential value in military training, where accidents due to stalls and spins took hundreds of lives. It has also installed an indicator on one experimental jet fighter. The Navy sees an aid that will permit carrier pilots to make approaches at lowest possible flying speed.

"It is conceivable that the ultimate answer will be two indicators on carrier planes, set to bracket the desirable approach speed," one spokesman for Dr. Greene reports. "One indicator can be set to buzz when the upper limit of desirable approach speed is reached, with a second indicator set to warn when the absolute minimum safe speed is reached." The device takes into consideration the differing stall speeds produced with varying power settings, flap positions, or landing gear positions.

As long as we build aircraft that will stall, the case for adding stall warning indicators to every one of them at the factory seems so strong as to be unworthy of argument. If industry is not alert enough to take the initiative on this advance in public safety, the government should require such a device on every commercial aircraft built.

ROBERT H. WOOD



The Ryan "Navion" is a 4-place, all-metal, low-wing monoplane. Powered by a 185 h.p. engine, its top speed is 160 m.p.h. It lands in 335 feet with flaps down. The "Navion" was built for comfortable 500-mile flights at high cruising speeds and can carry a useful load of over half a ton. Seven windows of Du Pont "Lucite" acrylic resin provide full 360-degree visibility.

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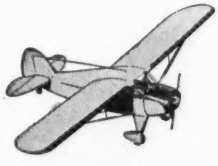

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